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CITY OF MANCHESTER.

REPORT

ON THE

Health of Greater Manchester,

1894.

BY

JAMES NIVEN, M.A., M.B.

MANCHESTER:
H. Blacklock & Co., Printers, Albert Square.
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Public Health Office,
Town Hall, Manchester,
September 3rd, 1895.

TO THE RIGHT HONOURABLE THE LORD MAYOR AND THE CORPORATION OF THE CITY OF MANCHESTER.

My Lord Mayor, Aldermen, and Councillors,

I have the honour to submit to you my first Report on the Health of the City of Manchester.

The Report commences with a discussion of the Statistics for 1894, the chief feature being the exceptionally low mortality for the year. The various infectious diseases are treated of in this section at some length. The extensive improvements in back-to-back property which have gone on in recent years, and which are largely due to the energy of the Chairman of the Sanitary Committee (Alderman Walton Smith), seemed to call for an inquiry into the assumption that back-to-back houses in Manchester are specially inimical to health, an inquiry which quite bears out this assumption.

The relations of the present system of removing excreta to Public Health are discussed in a subsequent section. In connection with this subject, I have to acknowledge the courtesy with which the Chairman and Members of the Cleansing Committee have received my communications, as well as the assistance which they have given to the Sanitary Committee in making improvements. I beg to commend this matter to your careful consideration. I would also acknowledge the valuable assistance given by the Officials of the Cleansing Committee in rapidly preparing Clayton Vale Hospital for the reception of acute cases of Smallpox.

In a section on our food supplies, I have pointed out the necessity for increased supervision of food stuffs, and for an improvement in the methods of producing and distributing milk.

An effort has been made to deal with insanitary bakehouses in an increasingly firm manner, with a fair measure of success.

The immense amount of work done by the Sanitary Committee and Officials is summarised by Mr. A. T. Rook, the Superintendent of the Sanitary Department, in a special report; and a brief statement by Mr. R. D. Callison gives an outline of the work performed by the Cleansing Department.

I beg to thank the Council for the kind manner in which they have accepted my services, especially the Members of the Sanitary Committee, with whom I have been more particularly connected, and my Fellow Officials for their unfailing courtesy and co-operation.

I have the honour to be, My Lord Mayor and Gentlemen,
Your obedient Servant,
JAMES NIVEN.

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REPORT.

VITAL STATISTICS.

The Triennial Report compiled by Dr. Tatham deals so fully with the Vital Statistics of Manchester during the years 1891–93 that it seems almost a work of supererogation to enter again so soon on a discussion of the figures. I propose, however, to use the form of tables which he has drawn up for those years in discussing the Vital Statistics of 1894.

From Table F it will be seen that since 1871 a gradual decline has taken place in the marriage rate from 24·2 per 1,000 in that year to 16·0 in 1893, while the birth-rate has undergone a reduction from 40·0 per 1,000 in 1876 to 31·8 in 1894. This is unquestionably due, in the main, to economic causes, and it may be doubted whether such causes would not outweigh all social or other elements in determining the additions to the population. The influence of a diminution so marked in the marriage and birth rates is bound to make itself speedily felt on the mortality rates.

Now the death-rate is very high of children under five years of age, while above the age of five it is comparatively low, being lowest of all at ages 10 to 15. Hence it is manifest that a comparatively high marriage and birth rate will have the immediate effect of raising the total death-rate of the population, but, after a lapse of some years, will tend to lower the death-rate by bringing an increased number into those ages at which the death-rate is comparatively low. The high birth-rates in the years 1871–79 would thus, of themselves, have had the effect of raising the death-rates in those years, although by the end of the period an ameliorating effect would have made itself manifest. At the end of that period, however, the birth-rate diminished, and the children who escaped in the years of more rapid multiplication were getting older, so that we should expect an increased tendency towards a reduced death-rate. With the reduction of the birth-rate such an increased tendency does, in fact, make itself manifest.

On referring to Table F, we see that a reduction of the death-rate, thoug not a steady one, occurs in the sense indicated.

If, however, we calculate out the increase in the population in any year, as shown by the excess of birth-rate over death-rate, and compare with the increase as calculated from the Census returns and exhibited in Table F, we perceive that the actual increase from 1871 to 1890 exceeded considerably that which would have accrued from excess of births over deaths. There is no doubt that this increase was due to the influx of people, mainly young, from other parts—that is, to an influx which should have the effect of steadily lowering the death-rate. Since the Census in 1891, however, the natural increase of the population has exceeded the increase as computed from the Census populations in 1881 and 1891, and it is probable that the population is increasing more rapidly than the calculations indicate. We may safely say, in spite of these interferences with the natural increase of the population, that the decline in the death-rate is partially accounted for by the marked decline in the birth-rate following on a high birth-rate.

In order to arrive at a more exact idea of what has been the degree of progress made, if any, it is necessary to ascertain what has been the death-rate prevailing in recent years as compared with more remote years at different groups of ages. Such a comparison is given at page 20 of Dr. Tatham's Report for the years 1891–93. From this it will be seen that in the Manchester Township there has been a reduction in the death-rate at all ages between childhood and 65 years of age. There is, it is true, an increase in childhood, but I am disposed to consider that the figures there given show that an improvement has been going on in the centre of the City. This is counterbalanced, unfortunately, by an increase in the death-rate—conspicuous at every age-group but one—in the outlying townships. Doubtless this is due, in a considerable measure, to the increased density of population in those districts.

In dealing with the statistics of 1894, I propose first to consider the figures pertaining to the whole City, and then the figures relating to different portions of it. Finally, the specific fevers will be discussed.

The year 1894 was one of extremely low death-rates generally. In Manchester, as shown by Table F, the death-rate was only 19·8, being 3 per 1,000 less than in any year since 1871. This represents, as compared with that year, a saving of 1,500 lives on the present population of Manchester; as compared with the average of the three years 1891-93, a saving of over 2,000 lives. The causes of this great reduction must be sought partly by analysis of the death-rates from a variety of causes, and partly by comparison with other centres of population.

If, now, we refer to Table L, and compare with the table in Dr. Tatham's Report for 1891-93, we perceive that the death-rate is lower than in any of those years from a great variety of causes. It is lower from measles, enteric fever, influenza, diarrhœa, erysipelas, puerperal fever, tubercular disease, premature birth, old age, brain and nervous diseases, heart diseases, bronchitis, pneumonia, diseases of the digestive organs, and diseases of the urinary organs. It is evident that some general ameliorative conditions were present which gave an increased vitality and buoyancy to the human frame. This impression gathers strength when we find that the same low rate of mortality was general throughout the country. We must look to the radiant spring and cool summer and autumn of 1894 as being the principal factors in the great reduction of the death-rate. Whether there were other causes at work increasing the effect of the genial weather is a question which does not easily admit of answer. Certainly there was nothing which would account for anything more than a small reduction of the death-rate.

It is interesting to note that the reduction in the death-rate was greater in the Township of Manchester than in either the North or South divisions of the City, the death-rate being in the Township 5·48 less than the average of the previous three years, in North Manchester 4·53 less, and in South Manchester less by 4·03. The great reduction in the Township may, to some extent, be due to the efforts made in recent years to improve the dwellings in the older parts of the City.

When, now, we turn to Table 3 of the Registrar-General's Annual Summary for 1894, we find that in the general reduction of death-rates Manchester occupies a position but a little better than usual, being only below Liverpool, Salford, Preston, Sunderland, and Wolverhampton.

On reference to Table M we find that the mortality at different groups of ages for the whole City are as follows :—

	Under 5 years	5 to 15	15 to 25	25 to 45	45 to 65	65 and upwards
Average for 1891–93.........	83·18	4·65	5·31	12·87	37·32	124·70
1894	64·89	3·84	4·52	11·26	29·78	104·22

The mortality is thus lower in 1894 at all groups of ages, being less than the average of the preceding three years by the following amounts:—

Under 5 years	5 to 15	15 to 25	25 to 45	45 to 65	65 and upwards
22 %	17 %	15 %	13 %	20 %	16 %

The greatest proportional improvement last year took place, therefore, at early and advanced ages.

If we examine the Registrar-General's Tables 2 and 3 in the Annual Summary for 1894, we perceive that the Manchester death-rate is lower than that of Salford, Preston, Wolverhampton, and Sunderland only because the proportion of deaths under 1 year to 1,000 births is lower in Manchester than in those towns. At higher ages Manchester comes next to Liverpool. It is, therefore, in infant life that the greatest saving has been effected. This is largely due to the comparatively low mortality for Manchester from summer diarrhœa.

From Table 2 we perceive that the death-rate from fever, which was 0·19 per 1,000, is the same as the average for the 33 towns, although the mortality for London from that cause is only 0·15 per 1,000. It might be inferred, as the table shows, that the death-rate from typhoid fever is below that of many large towns.

The average fever death-rate in 1891-93 was for the 33 large towns 0·20, for Manchester 0·30; the Manchester rate was thus in excess by 50 per cent. In 1894 the rates were equal.

The average diarrhœa mortality in 1891–93 was for the 33 large towns 0·86, for Manchester 1·12. The Manchester death-rate was thus 30 per cent. above that of the 33 towns from this cause. The excess in 1894 was 23 per cent.

The relative improvement in these two filth diseases is, probably, due in some measure to the precautions taken in respect of them, which will be mentioned under their appropriate headings.

If we refer to Table L for further elucidation of the reduction of the death-rate in 1894, we perceive that a considerable reduction has taken place in certain groups of diseases, viz.: tuberculous disease, lung diseases, and influenza. From bronchitis the death-rate is less than the average for the previous years by 0·91 per 1,000, from pneumonia by 0·57, from other lung diseases by 0·09, from influenza by 0·30 per 1,000, from tuberculous disease by 0·28. These causes make altogether a reduction of 2·15. The total reduction is 4·64, and we are thus left with 2·49 per 1,000 to account for.

The diminution in old age and heart diseases, which may be associated with the diminution in influenza and chest diseases, is 0·33, in whooping cough 0·18, in measles 0·15, and in summer diarrhœa 0·42, leaving a difference of 1·41 to account for, which is spread over a number of minor causes.

The outstanding feature indicated by an examination of the details is the general improvement, suggesting especially a diminished strain on the lungs, with a consequent lessened strain on the other organs.

Table G presents the mortality from another point of view, and gives a comparative view of the death-rates from certain groups of causes since 1881. It brings into striking relief the diminution from lung diseases and tuberculous disease in the death-rates for 1894, which are the lowest recorded. The same is also true of diseases of the digestive system, as well as of diseases of the nervous system. From cancer alone is the mortality higher than usual.

The death-rate from puerperal fever is also the lowest recorded, and that from child-birth is much lower than in recent years. It is to be hoped that this may be taken to indicate a more strenuous effort to diminish the dangers of mothers at this most perilous period in their lives.

Table B enables those not so familiar with death-rates to form easily an estimate of the classes of disease in which the greatest improvement is manifest. These are miasmatic diseases (including the infectious group), diarrhœa, septic diseases, developmental diseases (including the fatal diseases peculiar to new-born infants, as well as the conditions described as old age), diseases of the nervous system, diseases of the circulatory system, respiratory diseases, diseases of parturition, and deaths from ill-defined causes.

Death-rates at different ages for the whole City.

Further light may be expected to be thrown on the low death-rate of 1894 by studying at different age-groups the death-rates from groups of causes given in Table M. We thus find that, at ages under five, the death-rates in 1894 were comparatively low from measles, whooping cough, typhoid fever, diarrhœa, tubercular disease, brain disease, diseases of the lungs, and diseases of the digestive system. The reduction is particularly marked in lung disease and diarrhœa. At ages 5 to 15 the death-rate is comparatively low from scarlet fever, typhoid fever, tubercular disease, brain disease, and diseases of the lungs. At ages 15 to 25 the reduction is most marked in typhoid fever, tubercular disease, and diseases of the lungs. At ages 25 to 45 in typhoid fever, brain diseases, and diseases of the lungs. At ages 45 to 65 a diminution of the typhoid fever death-rate is again to be noted, but much more conspicuous are the lowered rates from diseases of the lungs, heart, brain, digestive and urinary systems, especially from the first named. Over 65 the principal reductions are in diseases of the lungs, heart, and brain.

Thus, at all ages, there is a marked reduction in the death-rate from respiratory disease, and there is also a notable reduction at all ages from brain disease. With the diminished incidence of disease on the lungs the general diminution of the death-rate from local diseases was to be expected. But, in addition, there is a marked reduction in the zymotic death-rate, and particularly in typhoid fever—this reduction affecting all ages.

We have already seen that it is particularly in respect of the infantile death-rate that the year 1894 is remarkable. This will at once be seen from the deaths of children per 1,000 born in the years 1891–94 :—

1891	1892	1893	1894
191·71	178·24	201·39	158·54

Table K shows that this great reduction in the deaths of infants is manifest in a number of diseases, most markedly in diarrhœa and lung disease, but also in measles, whooping cough, convulsions, and wasting diseases.

Table E is of interest as showing us what multitudinous dangers infants pass through, and from what causes they die. During the first three months of life they are swept away in large numbers by the conditions classed as premature birth, convulsions, wasting, lung diseases, unnamed causes, overlaying, diarrhœa, whooping cough, and hereditary syphilis. During the second three months they continue to die at the same rate from lung diseases ; while they perish at an increased rate from whooping cough, diarrhœa, tuberculosis, and brain disease. A large number, though much smaller than in the first three months, die from convulsions, wasting, unspecified causes, and overlaying.

At the ages of six to twelve months the tribute exacted by lung disease continues undiminished. Whooping cough and measles now levy a heavy toll. Diarrhœa carries away a large number, though at a diminishing rate. Tuberculosis also continues to carry off many, though also at a diminishing rate. The same is the case with convulsions and wasting diseases, as well as in respect of unclassified and ill-defined disease. The death-rate from brain diseases remains but little altered, though rather increasing.

Between the ages of one and two years, whooping cough and measles exact their heaviest mortality; lung diseases, convulsions, brain diseases, ill-defined causes, and wasting are responsible for a large number of deaths; and scarlet fever and diphtheria now begin to carry off a considerable number.

In the third year of life, lung diseases and tuberculosis still carry off a large, though much-reduced, number.

The scarlet fever fatality increases up to the fourth year of life, and then begins to diminish. Diphtheria exacts a fairly uniform tribute between the ages of one and five. Lung diseases, brain disease, and tuberculosis carry off large, though diminishing, numbers.

The child is, therefore, assailed by many fatal diseases one after the other.

It might be found useful to issue, with instructions how to feed and tend the infant, a paper of instructions of what dangers might be expected, and how they can best be guarded against.

If the child born in wedlock incurs many dangers, the illegitimate infant has a much more severe ordeal to undergo, as will be seen from the following figures:—

Percentage of Illegitimate to total Births		Proportion of Deaths under 1 year per 1,000 Births		
		Total	Legitimate	Illegitimate
1891	4·23	192	184	375
1892	4·10	178	170	367
1893	3·72	201	190	498
1894	4·42	159	150	338

Table F permits a comparison to be made between the year 1894 and previous years, beginning with 1871, so far as the various zymotic diseases are concerned, and it will thus be seen that the death-rate from each of these diseases is much below the average of 20 years beginning with 1871, with the single exception of diphtheria, which has shown in recent years a decided tendency to increase. The same table shows that a far higher proportion of deaths occurred in public institutions in 1894 than in any previous year. This tendency towards the increased recourse to public institutions, where the conditions of treatment are much better than can be had at home, may have had some effect in reducing the death-rate.

The following table shows the number of deaths occurring in each of the Public Institutions connected with the City.

TABLE I.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS, 1894, IN PUBLIC INSTITUTIONS.

Township	Name of Institution	Population, 1891	Deaths, 1894
ANCOATS	Ancoats Hospital	64	107
CENTRAL	Workhouse Casual Wards	167	1
	Royal Infirmary	260	288
	St. Mary's Hospital	27	15
	Lock Hospital	25	...
	Eye and Ear Hospital	7	...
	Alsop's Boys' Home..................................	11	...
	St. Joseph's Girls' Home............................	17	...
	Chetham Hospital..................	100	...
	Mission Refuge (St. John's Parade)	8	...
ST. GEORGE'S ...	Girls' Home (Charter Street)	21	...
CHEETHAM ...	Her Majesty's Prison	922	4
	Boys' Refuge	185	...
	Girls' Friendly Society	18	..
	Clinical Hospital	36	64
CRUMPSALL ...	Manchester Workhouse	2,608	853
	Prestwich Workhouse	305	82
BLACKLEY	Manchester and Salford Reformatory	76	...
	Litchford Hall	152	4
	Well's House Convalescent Home..............	10	...
MOSTON	St. Mary's Home	34	...
	St. Bridget's Orphanage	32	...
NEWTON....	Monsall Hospital	185	162
	Little Sisters of the Poor (Culcheth Hall) ...	107	11
CLAYTON	Clayton Smallpox Hospital		5
ARDWICK	Industrial School	203	...
	Nicholls Hospital	100	...
RUSHOLME......	St. Joseph's Girls' School	150	...
	St. Mary's Home	28	...
CHORLTON-ON-MEDLOCK	St. Joseph's Boys' School	413	...
	Royal Eye Hospital	59	...
	Little Sisters of the Poor (Plymouth Grove)...	182	17
	Casual Wards (All Saints)	21	...
	Southern Hospital	23	...
	Cancer Hospital	19	21
	Maternity Home	11	11
	Home for Young Girls.....................	18	...
	Rylands' Orphanage..................................	17	...
	Church Army Labour Home	20	...
	Penitentiary	51	...
HULME	Cavalry Barracks	404	2
	Boys' Home (Chester Road)	20	...
* OUTSIDE CITY.	Withington Workhouse	1,375	438
	Ashton-under-Lyne Workhouse	...	3
	Pendlebury Hospital	50	48
	Prestwich Lunatic Asylum	755	66
TOTALS.........		9,296	2,202

* Proportion only.

Manchester Mortalities in 1894 *compared with those of England and Wales in* 1881–90.

The following table enables us to compare the distribution of mortality at different ages in Manchester in 1894 with that which prevailed in England and Wales during the decade 1881–90. The death-rates in Manchester in 1894 are exceptionally low. With that deduction, however, we are reminded by this comparison that the heavy mortality which we undergo falls principally on childhood and on adult life, the intervening periods of life escaping comparatively easily.

TABLE 2.—Annual Rates of Mortality in Manchester in the Year 1894 at Twelve Groups of Ages amongst Persons, Males, and Females, compared with the Average Rate at those ages in England and Wales during the Decennium 1881–90.

	Persons		Males		Females	
	Manchester, 1894	England and Wales, 1881-90	Manchester, 1894	England and Wales, 1881-90	Manchester, 1894	England and Wales, 1881-90
All Ages	19·82	19·17	21·08	20·28	18·66	18·06
0—	64·89	56·77	69·46	61·59	60·41	51·95
5—	4·85	5·31	4·97	5·35	4·74	5·27
10—	2·80	3·04	3·04	2·96	2·57	3·11
15—	4·05	4·38	4·54	4·33	3·60	4·42
20—	5·01	5·64	5·40	5·73	4·67	5·54
25—	8·43	7·20	8·81	7·78	8·08	7·41
35—	14·98	11·51	15·53	12·41	14·45	10·61
45—	22·57	17·23	26·13	19·36	19·38	15·09
55—	42·85	31·57	48·15	34·69	38·56	28·45
65—	86·97	65·38	97·09	70·39	80·02	60·36
75—	176·18	138·88	196·41	147·14	164·18	130·62
85	227·91	288·32	289·86	305·81	198·63	270·82

COMPARISON OF MORTALITIES IN THE DIVISIONS OF THE CITY.

Influence of Density.

In determining how the high death-rate in Manchester arises, and therefore where more particularly to direct our efforts to reduce it, our first step will be, as far as possible, to determine what is the distribution of the excessive mortality in different parts of the City, and concurrently to enquire what are the actual conditions prevailing which may serve to explain such distribution, and which may themselves be susceptible of modification.

First, then, as to the statistics. The City of Manchester is composed of three divisions, designated respectively the Manchester Township, North Manchester, and South Manchester. The constituent sub-divisions of these groups, their population, extent, degree of density of population, birth-rates, and death-rates, are shown in Table H. On examination of this table, and of the corresponding tables for 1891, 1892, and 1893, we perceive that the death-rate is considerably higher in the Manchester Township than in South Manchester, and in South Manchester than in North Manchester. The same table shows that North Manchester is much less densely inhabited than South Manchester, and South Manchester than the Manchester Township. There is thus a general relation between a high density of population and a high death-rate, but that this is not the sole determining factor in the high death-rate of Central Manchester is at once seen when we examine the death-rates of the divisions of the Manchester Township, the death-rate in the Central Division being higher than in St. George's, although the population is not half so dense, and considerably the highest in Ancoats, although the density of population does not equal that in St. George's.

In North Manchester the mortality in Beswick is decidedly lower than in Bradford, although Beswick is much the more densely-inhabited district; and Blackley, which has a very low density of population, has a comparatively high mortality, as will be seen at pages 108 and 110 of Dr. Tatham's Triennial Report

South Manchester is in parts very densely populated; and here the district of Hulme, which shows by far the largest number of persons to the acre in the City, has considerably the highest death-rate, which, nevertheless, comes far behind that of Ancoats, with a much lower density.*

Then, again, West Gorton, though much less densely inhabited than Chorlton-on-Medlock, has a higher death-rate over the years 1891-93; while the neighbouring district of Openshaw, which has again a much lower density of population than West Gorton, undergoes a death-rate but little lower than West Gorton in the same years. There are thus, clearly, local factors in operation which to a large extent override the effects of density.

Comparison of the Manchester Township with the other divisions of the City.

A study of the causes of death may serve to throw some light on these factors. If we refer to Table L as given in the present report, and to the corresponding tables in Dr. Tatham's Triennial Report, we find that the death-rates in the Manchester Township are clearly and markedly preponderant from the following causes: Lung disease, brain and nervous diseases, heart disease, phthisis, and diarrhœa. There is also an excess in urinary diseases year by year. With reference to the excess in heart disease, it is clearly not due to rheumatic fever, since in that disease there is no such preponderance. It must be ascribed to the greater strain which the heart undergoes in the Central District from lung disease and other causes. Now the excess in lung disease may be ascribed in part to injurious occupations, but must be due mainly to the greater amount of impurity generally diffused, and which the lungs are obliged to inhale. Of phthisis, nothing is more certain than that it is intimately associated with insanitary conditions, such as a polluted subsoil, and with damp, dark, crowded, and ill-ventilated dwellings. It is, however, the case that many vagrants come into the City on their way to the workhouse, where they perish, frequently from phthisis. It would not be well, however, to draw too positive inferences from these figures, until we have referred to the comparison made in another table of the death-rates from groups of causes at different ages. With regard to summer diarrhœa, no such exception can be taken. It is a disease of infancy, and its excessive incidence betokens exceptionally filthy conditions or else great parental neglect, or, more probably, both. Taking the group of causes together, we may say that the excessive death-rate from them in Central Manchester points to exceptionally insanitary conditions.

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* Density as discussed above is simply another name for the number of inhabitants per acre. If, however, one district has a great many more workshops and factories than another, the inhabitants may be more crowded together in the former, even if there are much fewer people living on an acre of ground. To be quite satisfactory, a comparison of densities should take into account only the space covered by dwellings.

No marked preponderance occurs in the ordinary zymotic death-rate in the centre of the City, and what preponderance from time to time occurs may be reasonably ascribed to greater density of population. To this remark whooping cough is an exception; but, as I have elsewhere pointed out, death from whooping cough is found to be intimately associated with insanitary conditions.

Comparison of North Manchester with South Manchester.

When we compare North Manchester with South Manchester, we find that in regard to lung diseases and phthisis it has steadily through the four years considerably the lower mortality. The same is true of brain and nervous diseases, of heart diseases, and of diseases of the urinary organs. It is, however, not true of diarrhœa. Those special conditions which cause diarrhœa are about equally distributed in both areas. In respect of one disease alone North Manchester comes off badly, viz., diphtheria. If, now, we consider the mortalities in the three divisions at groups of ages, and take first Table K, showing the infantile mortality in the three divisions in connection with the same tables at page 34 of Dr. Tatham's Report, we find that from wasting diseases the Manchester Township shows far the highest death-rate, and South Manchester a higher death-rate than North Manchester.

The same gradation is also observed in regard to the cause "found dead in bed," which must be taken to argue a class of people in Central Manchester more careless of infant life than in the other two divisions.

The same declension in the number of deaths from the Manchester Township to South Manchester, and from South Manchester to North Manchester, is also seen in respect of lung diseases, of convulsions, and other nervous diseases, and even for diarrhœa. But for diarrhœa the difference between North and South Manchester is not great.

Comparison of Manchester Township with the other divisions of the City at groups of ages.

If, now, we turn to the figures at groups of ages, we find that while the City of Manchester as a whole shows a mortality much in excess of all England, except during adolescence, no such exception manifests itself in the heavy mortality which prevails in the more central parts of Manchester. In infancy, childhood, adolescence, maturity, and old age, that portion of the City pays a steadily heavier toll than other parts. This is of importance to note, since it might be surmised that the larger number of poor disabled people, who are located in the central parts long enough to find their way into the workhouse to die, would seriously influence the relative mortalities. No such surmise can, however, be applied to the younger years of life, and it must, therefore, be assumed that influences exceptionally adverse to life exist in the Manchester Township.

To what extent different ages are affected is seen from these figures:—

DEATH-RATES UNDER 5 YEARS			
	Manchester Township	North Manchester	South Manchester
1891	108·59	72·23	80·68
1892	101·47	63·50	71·47
1893	105·85	68·45	81·24
1894	78·24	50·48	65·08
Average for 1891 to 1894	98·54	63·67	74·62
Percentage less than Township	...	35·4	24·3

From this we see the great difference existing between the divisions of Manchester as regards child mortality.

AVERAGE MORTALITY FOR 1891-94 AT GROUPS OF AGES			
Ages	Manchester Township	North Manchester	South Manchester
5 to 15	5·45	4·01	4·09
15 to 25	5·94	4·48	4·96
25 to 45	16·39	9·51	11·59
45 to 65	45·84	27·51	32·65
65 and upwards	143·21	104·98	113·91

PERCENTAGE LESS THAN TOWNSHIP AT GROUPS OF AGES		
Ages	North Manchester	South Manchester
5 to 15	26·4 %	25·0 %
15 to 25	24·6 %	16·5 %
25 to 45	41·9 %	29·3 %
45 to 65	40·0 %	28·8 %
65 and upwards	26·7 %	20·5 %

These figures show conclusively the disastrous effects of the conditions of life prevailing in the heart of the City. The great excess prevailing at ages 25–65 may be in part due to the migratory element. But the heavy mortality prevailing at earlier ages is susceptible of no such deduction.

Table N enables us to follow these differences more into detail, which is rendered necessary that we may check any preconceived ideas as to how these differences come about by an actual reference to fact.

At ages 0–5 there is a marked excess in the mortality of the Manchester Township in diseases of the lungs, from diarrhœa and diseases of the digestive system, from diseases of the brain, and, except in 1894, from measles and whooping cough. This excess is mainly caused by the high infantile mortality. From tubercular disease, however, at this age, South Manchester has the highest mortality in each of the four years. This is a curious circumstance, the causes of which will be difficult to assess. This portion of Manchester is probably damper than the other two divisions, and, moreover, there is reason to believe that comparatively little cow's milk is used in the township—a circumstance which, though exercising a disastrous effect in regard to most diseases, will tend to lower the death-rate from tuberculous disease.

At ages 5–15 there is in each of the four years an excess of mortality in the Manchester Township from diseases of the lungs; in 1891, 1892, and 1894 from tubercular disease; in 1892, 1893, and 1894 from diseases of the brain; in 1892 and 1894 from enteric fever.

At ages 15–25 there is in each of the four years an excess in the township from diseases of the lungs; and in 1891, 1892, and 1894 from tubercular disease; in 1891, 1892, and 1894 from enteric fever.

At ages 25–45 there is in each of the four years an excess from tubercular disease, from diseases of the lungs, of the heart, and of the brain, very marked in the case of tuberculosis. In 1892, 1893, and 1894 there is a higher mortality in the township from urinary diseases.

At ages 45–65 there is a striking excess in the township from diseases of the lungs and from tubercular disease in each of the four years. There is also an excess in diseases of the heart and in diseases of the urinary system. In 1891, 1893, and 1894 there is an excess of deaths from diarrhœal disease.

At ages over 65 there is again a striking excess in the township from diseases of the lungs and from tubercular disease in each of the four years. The same is now true of diseases of the heart and of diseases of the urinary system.

Thus, running through all ages is the excessive incidence of lung disease on the inhabitants of the central portion of Manchester. This may be ascribed to a variety of causes, and more especially to want of light and free movement of air, with a consequent greater abundance in the air of injurious elements, both solid and gaseous. A greater degree of crowding is also present. There is, moreover, no doubt whatever that intemperance has a powerful influence in causing diseases of the lungs, and there is little doubt that intemperance is more prevalent among the inhabitants of the centre of Manchester than in the outskirts.

Then, again, at all ages except childhood, there is an excessive mortality from tubercular disease. The effective causes of this disease are so numerous that it is rather difficult to disentangle them. Any cause which produces marked weakening of the frame lays it open to the infective elements which produce the disease. Amongst those on which the greatest stress is laid are dark, damp, crowded, and badly-ventilated dwellings, dusty occupations, reckless and intemperate habits, and want of personal cleanliness. It is doubtful whether as regards occupation the inhabitants of Central Manchester undergo any excessive exposure. We must, therefore, conclude that the special injurious influences lie between the dwellings and personal habits.

We have already seen that the high infantile death-rate points to greater carelessness on the part of the mothers—a point to which I shall return later on. The excessive incidence of heart disease must be taken in connection with that of diseases of the lungs, and, if it has any special significance, may be taken to emphasise the effect which intemperance has in producing a high death-rate. The special incidence of urinary diseases is mainly in diseases of the kidneys, and may again be associated with the same cause ; but here also it has to be remembered that much of the injurious matter which enters the system has to be eliminated by the kidneys, and that if, as we have seen reason to suppose, more injurious matter is taken into the lungs and alimentary canal by the inhabitants of the township, then the consequent stress will exhibit itself in an increase of kidney disease. Thus, at every point, we are confronted with the combined effects of bad hygienic conditions and personal carelessness. Nevertheless, we may safely conclude that where personal carelessness is associated with such severe consequences, the other element of bad hygienic conditions is also abundantly present.

Comparison of North Manchester with South Manchester at different ages.

If we compare South Manchester with North Manchester, we find that there is a similar preponderance of mortality at all ages, except in 1894, when the death-rate is lowest in the Southern Division at ages 5 to 15 and 15 to 25.

At ages 0–5 in each of the four years the death-rate is highest in South Manchester from whooping cough, diarrhœa, diseases of the lungs, and (with the exception of 1894) from diseases of the brain. The mortality in childhood in South Manchester from tubercular disease is higher than in either of the two other divisions, and much higher than in North Manchester. We may safely infer that the condition of South Manchester is much less sanitary than that of the Northern Division. At ages 5–15 in all four years there is a higher death-rate in South Manchester from tubercular disease. At ages 15–25 there is a higher death-rate from diseases of the lungs and (with the exception of 1894) from tubercular disease. At ages 25–45 the death-rate in the Southern Division exceeds from tubercular disease, and to a less extent from diseases of the lungs, heart, brain, and urinary organs. At ages 45–65 there is again a marked excess from tubercular disease, and there is also a preponderance of death-rate from diseases of the lungs, heart, and of the digestive and urinary organs. At ages 65 and upwards there is a great excess in diseases of the lungs, and the death-rate is also higher from diseases of the digestive and urinary organs.

Thus, as before, the excess in death-rate is most marked in tubercular disease and in diseases of the lungs.

Mortalities in the different districts of the City.

We may now pass to a consideration of the districts of which the various divisions of the City are composed.

Particulars are given in Table H with regard to the birth-rates and death-rates of the various districts, from which we see that they vary greatly in their birth-rates as well as in their death-rates. Just as there is a general correspondence between density of population and high death-rate, which is shown not to be a necessity by the statistics of the different districts, so there is a general correspondence between a high birth-rate and a high death-rate, which is equally shown not to be necessary. Indeed as regards the latter connection, a high sustained birth-rate should lead to a lowered mortality.

The highest birth-rates are found in Beswick and Bradford in North Manchester; in St. George's and Ancoats in the Manchester Township; in Hulme, Openshaw, Ardwick, and West Gorton in South Manchester. The death-rates in these districts are amongst the highest, though very variable. On the other hand, the death-rate in the Central district comes next after that in Ancoats, although the birth-rate is comparatively low. It is very low in Cheetham, where the birth-rate is tolerably high. It is again high in Blackley, where the birth-rate is one of the lowest. The same relative position of the birth-rates is maintained year after year, and must lead to populations having very different age groupings. The proportions of those living at different ages is, in fact, shown by the Census to be very different for the different districts; and, in order to compare the different death-rates with any advantage, it is necessary to make a correction for this factor. Such a correction is made for the years 1891–93 at page 30 of Dr. Tatham's Triennial Report, and is continued in the following table for 1894:—

TABLE 3.—YEAR 1894.—RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS LIVING.

Groups of Civil Parishes in the Sub-Districts of Manchester, arranged in order of their corrected Death-rates	* Standard Death-rate	† Factor for correction for Sex and Age Distribution	Recorded Death-rate, 1894	‡ Corrected Death-rate, 1894	§ Comparative Mortality Figure
Moston	17·72	1·0807	11·25	12·16	733
Cheetham and Crumpsall	17·91	1·0693	12·40	13·26	799
Blackley and Harpurhey	17·16	1 1157	14·56	16·25	979
Clayton	17·71	1·0815	16·85	18·22	1,098
Ardwick, Openshaw, West Gorton, and Rusholme	16·81	1·1374	17·23	19·60	1,181
Newton Heath, Bradford, Beswick, and Kirkmanshulme	17·08	1·1211	17·69	19·84	1,196
Chorlton-upon-Medlock	16·29	1·1755	18·17	21·36	1,288
Hulme	16·93	1·1309	22·09	24·98	1,506
St. George's	16·89	1·1340	23·20	26·31	1,586
Ancoats	16·83	1·1381	26·91	30·63	1,846
Central	16·25	1·1782	26·74	31·50	1,899
England and Wales	19·15	1,000	16·59	16·59	1,000

* The standard death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age periods in each town were the same as in England and Wales during the ten years 1881-90, the death-rate at all ages in England and Wales during that period having been 19·15 per 1,000.

† The factor for correction $\left\{=\frac{19\cdot15}{\text{Standard death-rate}}\right\}$ is the figure by which the recorded death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The corrected death-rate is the recorded death-rate multiplied by the factor for correction.

§ The comparative mortality figure represents the corrected death-rate in each town compared with the recorded death-rate at all ages in England and Wales in 1894 taken as 1,000.

The result of this correction shows, in the first place, that although the districts having a high birth-rate have also generally a high death-rate, the high death-rate has occurred from quite other causes, and has been not on account of the high birth-rate, but in spite of it. It emphasises, in the second place, the excessively insanitary conditions which exist in the Manchester Township, and produce death-rates so enormously exceeding those of the country generally, and also of the rest of the City. Examination of the statistics also indicates that, with the exception of Moston, Cheetham, Crumpsall, and Rusholme, every district in Manchester must be suffering from causes specially injurious to health.

The extent to which the death-rate, as ordinarily calculated, is altered for each of the 33 great towns by the application of the correction for age and sex distribution is shown in Table Q in the Appendix.

It is true that for the year 1894 the death-rates are comparatively low in a number of districts. But this year is altogether exceptional, and points rather to what is possible than to what can be steadily realised for many years to come.

With a view of providing some guide to the points on which the Sanitary Committee may fix their attention, Dr. Tatham has mapped out the mortalities in groups of enumeration districts. While this will serve as a very useful guide, subject to some deductions, which have been pointed out in my remarks on back-to-back houses, it has seemed to me advisable also to obtain the individual experience of the Sanitary Inspectors on a number of points in connection with their districts, so that we may compare the features of different portions of the City, and also at the same time arrive at some idea as to what general causes might be in operation to cause such an extensive excess of mortality.

The points on which I asked for their experience were these :—

Conditions regarding the Separate Districts to be reported on by the Inspector.

I.—(1.) Class of people inhabiting the district.

(2.) The dwellings, whether old or recent. The degree of crowding of dwellings, as regards backyards and passages and width of streets, &c. Whether generally well lighted.

(3.) What prevalent nuisances exist in the district. Drainage? Closets? Dirt? Overcrowding?

(4.) The principal industries carried on, especially in their relation to health. Occupations injurious either to the workpeople or to others.

II.—Can the Inspectors mention any special influences at work affecting the health of their districts, other than those enumerated. In other words, has the Inspector formed any opinion on the causes injuriously influencing his district.

It was not intended from these particulars to expect a complete answer to the question in what the differences between the various districts consist, but only to obtain suggestions which might throw some light on the great discrepancies which exist, and on the general influences which cause a mortality so large over so extensive an area. The reports show that great differences exist as to the class of people inhabiting the different portions of Manchester, and that the status and habits of the people often form a very serious element in the production of a high mortality.

Thus over large portions of the Township of Manchester there is a high degree of intemperance, which no doubt exercises a very prejudicial effect on health, both directly and indirectly. In some of the districts, such as Angel Meadow and an area round Deansgate, the mortality is artificially raised by the movement of tramps, who come from outside the City. The more central portions of Manchester are much crowded, and even in the Central District the degree of crowding is excessive, a large number of warehouses taking the place of houses, and depriving them of light. While, however, the habits of the people are most injurious in the Manchester Township, there are also other specially injurious influences, such as narrow and badly-ventilated streets and courts, old and dirty houses, back-to-back houses, small yards and narrow passages, defective lighting, and probably an inferior quality of food. To some extent these conditions apply to other districts, but what most interests us are the conditions not peculiar to the township which apply to the other districts, and which produce in them so high a mortality.

Take, for instance, the district of West Gorton. Here the Inspector states that "the inhabitants are mostly of the artizan class. The dwellings are in the main "recently built, and are on the whole open and free from overcrowding. The "drainage is fairly good, with certain exceptions. The closets are generally of the "old midden style, and perhaps about one-fourth of them adjoin the walls of "the sculleries, mostly in Longsight. The "Black Brook" is very offensive. Again, "The Inspector is of opinion that the greatest evil in this district is "the style of closets, and the middens sometimes become quite unbearable in "the summer time."

Take, again, the Openshaw district. Here we have not such a clear case, but on the whole the district is inhabited by a steady class of people. "The "dwellings in the lower portion, which are all old houses, are crowded together, "with small backyards and narrow passages, but fairly wide streets, and they "are well lighted. Many of the streets are still unpaved." The factors which the Inspector selects as being most injurious are the midden ashpits and the unpaved streets, on the unlevel surfaces of which water lies till it gets stagnant. The same burden runs through nearly every report. The system of excreta collection and removal is undoubtedly a serious injury, and often an abominable nuisance.

For instance, in his account of the Bradford district, the Inspector describes the people as steady. Here the passages are narrow, and the yards are small and confined. The drainage is bad generally. There are about half and half of midden privies and pail-closets. The middens are in an abominable state—not drained at all, or imperfectly so, the walls and sides dilapidated, with no division, and a capacity for three or four months. It is true that he mentions other causes of bad health in the district, but no indictment could be more severe than the above.

There are, therefore, two prevalent conditions, viz. :—the bad system of collecting and removing excreta and the bad drainage, often combined with narrow passages and small yards, which are a serious nuisance, and in my opinion are responsible for much of the high death-rate in Manchester.

Most valuable information has been furnished in regard to the occupations pursued in different parts of Manchester, but I have postponed the discussion of this subject, the more so as the occupations cannot have a preponderant effect on mortality.

In attempting to reduce these mortalities we may proceed on two different lines—by measures aiming at injurious influences which are widespread, and which can only be attacked in mass, and by measures which assail smaller causes in detail. Of the former class are a radical change in the methods of excreta and refuse removal, and as rapid a reconstruction of the house drainage as possible. Probably the best method of carrying out these improvements would be to provide an annual sum for the purpose, and spread the process over a number of years.

INFECTIOUS DISEASES.

The diseases included in the Manchester Notification Act of 1881 are as follows: Smallpox, Scarlet Fever, Diphtheria, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Puerperal Fever, and Asiatic Cholera. Membranous Croup was added in 1892. The following cases were notified in 1894 and three previous years :—

	1894	1893	1892	1891
Smallpox.....................	282	607	118	2
Scarlet Fever	2,230	2,031	1,671	1,138
Diphtheria .... Membranous Croup ...	512	622	497	456
Typhus Fever...............	...	1	6	16
Enteric Fever...............	460	618	610	761
Relapsing Fever	...	...	...	4
Puerperal Fever	51	93	92	55
	3,535	3,972	2,994	2,432

For reasons given under the heading of measles, measles and whooping-cough have not been included in the list of notifiable diseases. But it appears to me desirable that certain forms of tuberculosis should be reported to the Health Office. I have postponed the discussion of this subject, which is rather an intricate one, to another year.

The total zymotic death-rates, which include those from diarrhœa, for the years 1891-94 are as follows :—

1891	1892	1893	1894
3·2	3·0	3·8	2·4

The total zymotic rate for 1894 was thus comparatively low. Nevertheless, a considerable strain was thrown on Monsall Hospital by the two diseases smallpox and scarlet fever, and the question of the Sanitary Authority themselves providing isolation for their fever cases became a prominent one. I advised the Committee that if Monsall Hospital were acquired, and sufficient provision made for the reception of smallpox at a distance from the City, the reasonable requirements of Manchester in respect of infectious disease would be met.

Supposing a smallpox hospital, with accommodation for 100 cases of smallpox, to be erected, Clayton Vale Hospital being held in reserve, there would then be ample accommodation for 550 patients.

The advantages to be derived from the notification of infectious disease cannot, however, be realised merely by the provision of isolation hospitals. The tact and knowledge possessed by the Sanitary Inspectors, and by those charged with the disinfection of infected articles and houses, are also factors of primary importance. It usually happens that inquiries into the origin of cases of infectious disease fall to the Sanitary Inspectors, inquiries which demand rather more knowledge than they often possess. Without a clear idea of the leading features of the different diseases, and of the channels by which infection arrives, it is difficult to know in any instance whether there is reasonable ground for seeking in any particular direction an explanation of the occurrence under consideration. I therefore prepared a memorandum for the guidance of the Sanitary Inspectors in their inquiries in reference to cases of smallpox, which was undoubtedly of some use. This must, however, always be a weak point. As regards the tact displayed in inducing parents to send their children to hospital, this is sufficiently shown by the high proportion of cases (66 per cent.) of scarlet fever isolated in hospital.

As regards the disinfection of houses, in consequence of experiments carried out by Professor Delépine, an integral part of the disinfection of houses has been made to consist in washing the walls and all nonmetallic surfaces with a solution of chloride of lime, 3 oz. to the gallon. Here, again, the judgment and care shown by the Inspector directing the operation are factors of prime importance.

A most essential feature in the ambulance arrangements is the care of the patients during removal, and their removal in such a manner that no harm can come to them in transit. The infection of scarlet fever is peculiarly liable to cling to any place into which it has been introduced. I have therefore drawn up instructions so that ambulances used in the removal of scarlet fever patients may not be used during the same day, nor, except after very rigorous disinfection, for the transport of other diseases.

Arrangements have been made with the School Board of such a nature as, it is hoped, will result in a considerable limitation of the fatality of measles and whooping cough. I must here acknowledge warmly the cordial co-operation which I have received from Mr. Wyatt, Clerk to the School Board, as well as from teachers, in carrying out measures of precaution relating to schools. Recently I have called on them for aid in searching out the sources of infection in scarlet fever and diphtheria. At the same time, a brief memorandum on scarlet fever, supplementary to the usual inquiry forms, has been supplied to the Sanitary Inspectors. I hope that Mr. Wyatt will extend to other diseases the valuable aid that he has given to the Health Office in regard to measles and whooping cough. In particular, I hope that a way will be found to keep separate the school books used by children at school.

Special arrangements have been made for limiting the spread of infection from cases of typhoid fever. The greatest barrier, however, to the limitation of infectious disease lies in the ignorance of parents of its appearances and effects. Nor is that care bestowed in our medical schools on the instruction of medical students in the recognition of these cases which their importance and the difficulty of the subject demands.

MEASLES.

The accompanying table shows that the mean mortality in Manchester from measles in the year 1889–93 was 0·75, as against 0·61 for the 33 large towns; while in 1894 it was 0·42, as against 0·63 in the same towns. This is a disease which may be expected to be more fatal in large and populous towns than in smaller centres of population.

MEASLES MORTALITY.—ANNUAL RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales	0·52	0·44	0·44	0·46	0·37	**0·45**	0·39
33 Great Towns	0·71	0·67	0·52	0·69	0·44	**0·61**	0·63
London	0·56	0·77	0·43	0·80	0·38	**0·59**	0·76
City of Manchester...	1·22	0·83	0·43	0·72	0·57	**0·75**	0·42
Manchester Township ...	...	...	0·68	1·32	0·86	**0·95**	0·26
North Manchester	...	...	0·44	0·44	0·63	**0·50**	0·30
South Manchester	...	...	0·27	0·49	0·35	**0·37**	0·60
50 Smaller Towns	0·62	0·35	0·62	...	...	**0·53**	...
67 Smaller Towns	...	...	...	0·40	0·51	**0·46**	0·31
Rural Districts	0·37	0·31	0·33	0·30	0·27	**0·32**	0·24

On April 24th, 1894, I presented the following report to the Hospitals Sub-Committee on the desirability of having measles and whooping cough added to the list of notifiable diseases, giving reasons why this course should not be adopted :—

"Public Health Office,
"Town Hall, Manchester,
"April 24th, 1894.

"*Notification of Measles, &c.*

"The Medical Officer of Health reports that he has given a careful consideration to several communications which have been received from important Associations in reference to the notification of disease.

"In a memorial from the Manchester Medico-Ethical Association to the Lord Mayor of the City of Manchester, dated October 18th, 1893, attention is directed to the much larger number of deaths from measles in 1892 than from scarlet fever in the same year, and to the prevailing idea among the poorer classes that measles is a trifling disease. It is believed that compulsory notification alone would bring home to the minds of the people the fact that measles is a grave disease. They, therefore, urge that measles should be included in the list of compulsorily notifiable diseases.

"A memorial of the Committee of the Manchester and Salford Sanitary Association, addressed to the Sanitary Committee of the Manchester City Council, and bearing date November 13th, 1893, gives the deaths in the City from scarlet fever, measles, and whooping cough for the years 1891 and

1892, and, connecting the large number of deaths from measles and whooping cough with the popular idea that these are slight diseases, expresses the opinion that the public mind will not be properly impressed with the seriousness of measles and whooping cough until they are scheduled for compulsory notification.

"The Committee of the Association do not anticipate that notification can stamp out an outbreak, but they submit that, were the cases notified, much might be done to prevent the spread of contagion, and to ensure such treatment of cases as would largely diminish the mortality from these complaints; and further, that notification would tend to minimise the danger which exists of non-notification of cases of scarlet fever by those who mistake that complaint for measles.

"Recognising the difficulty of expense, they suggest that the onus of notification might tentatively be limited to the parents or friends of infected persons, and that notification of measles only might at first be tried.

"A report by Dr. Tatham on the subject of the compulsory notification of measles, dated January 29th, 1894, states that as the responsibility entailed by any conclusion arrived at would fall on the future Medical Officer of Health, he should be consulted before any decided step was taken.

"A communication to the Lord Mayor of Manchester from the Committee of the Chorlton-upon-Medlock Dispensary, dated February 19th, 1894, recommends the compulsory notification of measles and whooping cough, on the ground that these diseases readily spread through the out-patients' department of that and other institutions. They do not think it necessary to remove cases of these diseases to hospital.

"A communication from the Guardians of the Poor of Chorlton Union, dated 19th March, 1894, encloses a resolution of the Guardians that, in the opinion of the Board, measles and whooping cough should be included in the list of infectious diseases for notification under the Act of 1889, and that copies of the resolution should be sent to the Medical Officer of Health for the City of Manchester and to the Local Government Board.

"It will be seen that the chief contention in favour of the compulsory notification of measles and whooping cough is that the poorer classes of the people would be educated to recognise the gravity of these diseases, and that in this way greater care would come to be exercised in treating children attacked by them. For practical purposes, in dealing with the advisability of extending compulsory notification, it will be convenient to consider measles only. The difficulties are much the same for the two diseases.

"The immediate advantages which might be anticipated from the notification of measles are :—1. That instructions could at once be given and insisted on for the isolation of individual cases, and for the exclusion from school and other institutions and assemblies of children likely to develop the disease.

2. Instructions could be given for the isolation and treatment of cases such as would materially assist in diminishing the fatality of the disease. It would be necessary for these purposes that notification should be tolerably complete, and this could only be expected if a fee were paid for notification. But, even when notification is as complete as can reasonably be looked for, the anticipated advantages may not be realised. Thus, in Edinburgh and Birkenhead, where measles has been notifiable since 1879 and 1882 respectively, neither the rapidity of diffusion of the disease, nor the fatality, have been reduced under notification, as will be seen from the appended figures for Edinburgh and Birkenhead.

"Supposing measles notified, and 2s. 6d. paid for each case, taking the average case mortality of 3 per cent. given by Dr. Henry Littlejohn for 10 years of notification in Edinburgh as applicable to Manchester, the number of cases of measles reported in Manchester would have been—in 1891, 7,333; in 1892, 12,300; in 1893, 9,767; and the expenses incurred for notification alone £916 12s. 6d., £1,537 10s., and £1,220 17s. 6d. respectively.

"The expense of notification would not be quite so great as this, owing to the smaller amount which would be paid for institutions, but we may assume that it would be over £1,000 per annum.

"This is, however, only part of the actual cost. Presuming an effort were made to cope with an outbreak of measles by isolation at home, this would entail a large amount of work thrown suddenly on the sanitary staff. Either the rest of their work would get neglected, or the staff would have to be increased.

"The experiences of Edinburgh and Birkenhead do not seem to hold out much hope from notification of measles apart from isolation in hospital. It is probable that the isolation of cases of measles in hospital would entail a certain reduction in the fatality of the disease, but it would do so at a very great expense, and it is questionable whether the return would justify the outlay.

"Besides the experience of Edinburgh and Birkenhead, I have thought it desirable to obtain also that of a number of other districts in which measles has been, or is now, notified. Of the medical officers of health who have answered my circular, the majority are either doubtful of the value of notification or regard it as of little value in preventing the spread of the disease.

"The reasons which make it, in my opinion, undesirable to adopt the compulsory notification of measles are these:—

"1. The death-rate per 1,000 living is highest in the second year of life, and unquestionably a very large proportion of the attacks occur at that early period. These are in a large number of instances treated at home, without medical attendance; and owing to the difficulty of diagnosis and the high infectiveness of the disease in the early stage before the rash appears, the disease is spread before it is possible to recognise it.

"2. Owing to its intense infectiveness, it spreads in the same manner among school children before the first cases have been recognised. Such notification returns as I have been able to obtain show that, almost without exception, the number of cases suddenly jumps up from one month to the next, illustrating at once the high infectiveness of the disease and the small influence which notification has hitherto exerted over its diffusion.

"3. Generally speaking, the mortality records of notification districts are not encouraging as regards the connection of notification with reduction of the death-rate from measles.

"4. Notification of measles is very expensive, and the expense incurred would be justified only by a considerable degree of control over the disease. Such a degree of control it is evidently difficult to obtain.

"5. Without isolation in hospital there is little prospect of being able to check the spread of measles, and I am not prepared to recommend that the disease should be isolated in hospital. Nevertheless, it is with great regret that I feel bound, at present, to express the opinion that it is undesirable to have these diseases compulsorily notified; and I consider that, in spite of the difficulties, an effort should be made in some measure to control their incidence on schools, and still further to diffuse a knowledge of the means by which they can be made less fatal.

"I append tables prepared by Mr. Roos, showing:—1. The death-rate in Manchester in 1891, 1892, and 1893 from scarlet fever, measles, and whooping cough at different ages. From this it will be seen that measles and whooping cough attack severely the first two years of life. If it were proposed to isolate these cases in hospital, their ages would be a serious obstacle. They will also come less under the notice of medical men than older children attacked by zymotic disease. 2. A table showing the comparative death-rates from measles, scarlet fever, and whooping cough per 1,000 of population in England and Wales, and in Manchester. This table serves to show how far the recent increase of the measles mortality is special to Manchester. It is clearly part of a general increase. 3. Tables showing the number of cases of measles notified month by month in Edinburgh and Birkenhead in the years 1884–93 (page 28) and 1882–92 (page 30) respectively, and, for the sake of comparison, corresponding figures for scarlet fever in Manchester (page 27). From these it is seen how rapidly the wave of measles advances as compared with that of scarlet fever. 4. Answers to a circular in reference to the notification of measles, tabulated so far as this is possible. This circular was addressed to the medical officers of health of a number of districts in which measles is or has been notified, selected according to population only. It will be seen that they are divided in opinion as to the value of notification in enabling them to control outbreaks.

"MEDICAL OFFICER OF HEALTH.

"The Hospitals Sub-Committee."

MANCHESTER.

Death-rates from Scarlet Fever per 1,000 of Population.

	All Ages	Under 1 Year	1–	2–	3–	4–	Under 5 Years	5–	10–	15–	20–	25–	35–45
1891..............	0·22	0·21	1·12	1·91	1·93	1·07	1·22	0·52	0·09	...	...	...	0·02
1892..............	0·27	0·21	1·43	1·57	2·39	1·96	1·48	0·60	0·11	0·02	0·02	...	0·02
1893..............	0·27	0·42	1·10	2·11	1·89	1·78	1·43	0·56	0·19	...	0·06	...	...
Annual Average, 1891–93	0·25	0·28	1·22	1·86	2·07	1·60	1·38	0·56	0·13	0·01	0·03	...	0·01

Death-rates from Whooping Cough per 1,000 of Population.

	All Ages	Under 1 Year	1–	2–	3–	4–	Under 5 Years	5–	10–	15–	20–	25–	35–45
1891...	1·02	13·75	13·48	5·72	3·45	1·73	7·81	0·33	0·02	...	...	...	...
1892...........	0·72	10·19	7·95	4·01	2·79	1·55	5·44	0·31	...	...	...	...	...
1893...........	0·46	6·27	5·44	2·89	1·89	0·65	3·51	0·19	...	...	...	...	...
Annual Average, 1891–93	0·73	10·07	8·96	4·21	2·71	1·31	5·59	0·28	0·01	...	...	...	...

1893.—65–75, Whooping Cough, 1 = 0·01.

Death-rates from Measles per 1,000 of Population.

	All Ages	Under 1 Year	1–	2–	3–	4–	Under 5 Years	5–	10–	15–	20–25
1891	0·43	2·98	7·86	3·26	1·29	0·91	3·26	0·19	...	...	0·02
1892	0·72	5·62	12·16	4·49	3·66	1·22	5·46	0·31	...	...	...
1893	0·57	5·08	9·77	3·90	1·58	1·13	4·33	0·20	...	...	...
Annual Average, 1891–93.	0·57	4·56	9·93	3·88	2·18	1·09	4·35	0·23	...	...	...

ANNUAL DEATH-RATES IN ENGLAND AND WALES, AND IN MANCHESTER PER 1,000 OF POPULATION.

Year	MEASLES		SCARLET FEVER		WHOOPING COUGH	
	England and Wales	Manchester	England and Wales	Manchester	England and Wales	Manchester
1875	0·26	0·54	0·85	0·92	0·59	0·88
1876	0·41	0·65	0·69	1·13	0·43	0·81
1877	0·37	0·59	0·59	1·05	0·46	0·84
1878	0·31	0·45	0·75	1·07	0·71	0·68
1879	0·36	0·35	0·69	1·07	0·50	1·09
1880	0·48	0·63	0·68	1·03	0·53	0·76
1881	0·28	0·29	0·55	0·34	0·42	0·71
1882	0·48	0·89	0·52	0·34	0·58	0·87
1883	0·35	0·71	0·48	0·81	0·39	0·62
1884	0·42	0·57	0·40	0·74	0·43	0·49
1885	0·53	1·08	0·23	0·17	0·48	0·71
1886	0·44	0·27	0·22	0·41	0·47	0·57
1887	0·60	1·54	0·28	0·63	0·40	0·50
1888	0·35	0·27	0·23	0·42	0·44	0·79
1889	0·52	1·22	0·24	0·45	0·43	0·45
1890	0·44	0·83	0·24	0·60	0·48	0·37
1891	0·44	0·43	0·17	0·22	0·47	1·02
1892	0·46	0·72	0·19	0·27	0.46	0·72
1893	0·37	0·57	0·24	0·27	0·34	0·46

MONTHLY NOTIFICATION OF SCARLATINA IN MANCHESTER SINCE 1882.

	January	February	March	April	May	June	July	August	September	October	November	December
1882	...	61	110	74	93	70	95	116	136	117	159	105
1883	101	90	87	70	130	119	155	163	153	235	216	200
1884	152	159	137	138	162	121	147	170	125	138	98	89
1885	80	59	40	66	48	45	54	62	85	86	72	111
1886	46	68	70	80	81	107	89	142	240	251	265	227
1887	161	174	134	115	125	159	177	325	361	371	348	204
1888	200	205	104	112	157	116	85	101	134	215	149	177
1889	185	160	119	97	140	118	196	171	256	210	172	134
1890	175	130	117	185	182	177	236	187	195	227	141	123
1891	123	111	96	60	61	68	56	71	107	113	169	108
1892	105	90	121	129	166	125	109	149	189	183	185	116
1893	113	123	146	108	192	147	146	169	234	238	252	165

EDINBURGH

MONTHLY INTIMATIONS OF MEASLES SINCE 1884.

YEARS	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
1884	791	555	363	231	167	131	81	46	31	16	31	33	2476
1885	33	56	62	82	122	193	198	113	55	23	7	14	958
1886	90	396	862	1278	1475	1068	470	89	35	33	13	24	5833
1887	77	122	238	213	126	69	37	27	66	120	331	943	2369
1888	1415	1106	666	287	116	88	74	23	13	19	17	12	3836
1889	31	26	74	61	33	33	191	85	43	275	745	1467	3064
1890	1379	898	1058	646	259	107	160	62	31	50	72	39	4761
1891	52	107	362	410	382	405	249	83	18	10	14	77	2161
1892	123	300	307	273	159	308	415	339	446	1237	2057	1837	7801
1893	983	498	237	153	150	200	89	42	23	33	72	34	2514
Total...	4974	4064	4229	3634	2989	2602	1964	909	761	1816	3359	4480	35781

The fee is 2s. 6d. for each case, and has cost the City £4,472 12s. 6d. during the past ten years for intimating measles alone.

EDINBURGH.

MORTALITY FROM MEASLES DURING THE UNDERMENTIONED YEARS.

YEARS	Deaths	Rate per 1,000	REMARKS
1875..............	22	0·105	Five years before the Act
1876..............	119	0·562	
1877..............	27	0·126	
1878...	205	0·943	
1879..............	21	0·095	
			Average, 0·366.
1880..............	182	0·816	Five years after the Act.
1881.....	22	0·096	
1882..............	87	0·376	
1883..............	138	0·588	
1884..............	70	0·283	
			Average, 0·431
1889..............	102	0·382	The last five years.
1890..............	241	0·888	
1891..............	70	0·267	
1892..............	396	1·495	
1893..............	151	0·564	
			Average, 0·719.

HENRY D. LITTLEJOHN, M.D.,
Medical Officer of Health.

Edinburgh, 27th March, 1894.

NOTE.—The Act came in force in November, 1879.

BIRKENHEAD.

Measles—Number of Attacks Notified in each Month.

Year	January	February	March	April	May	June	July	August	September	October	November	December
1882	29	5	2	6	14	40	68	48	39	158	149	57
1883	28	22	46	41	12	32	31	22	20	47	88	159
1884	104	90	147	159	106	79	31	21	43	74	49	38
1885	63	86	63	139	286	160	94	22	17	24	26	21
1886	35	42	59	48	132	144	92	27	8	2	5	1
1887	8	22	49	59	264	387	216	48	18	13	66	184
1888	105	67	48	41	23	40	91	30	9	37	125	203
1889	305	379	163	74	43	42	20	8	3	6	12	2
1890	9	11	7	9	16	35	145	76	173	340	449	350
1891	213	61	35	39	23	6	8	11	4	3	27	94
1892	50	180	294	198	221	327	136	32	18	8	32	46

Death-rates from Measles.

Year	1874	1875	1876	1877	1878	1879	1880	1881	Average 8 years	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	Average 11 years
Rates	0·32	0·59	0·48	0·10	0·91	0·28	0·18	0·58	0·43	0·39	0·45	0·44	0·83	0·23	0·82	0·14	0·63	0·90	0·34	0·62	0·53

TABULAR EXPOSITION OF ANSWERS TO QUESTIONS RELATING TO THE NOTIFICATION OF MEASLES.

District	Population	Year in which Compulsory Notification was adopted	Abandoned, with reason given	Death-rates per 1,000 of Population in years preceding and in years following notification	Fees paid, with annual expense of notification	What has been the impression of the Medical Officer of Health in regard to the value of notifying measles? Has it seemed that public institutions have been by this means protected?
EDINBURGH ..	270,588	November, 1879	......	Before Notification. 1875...0·105 1876...0·562 1877...0·126 1878...0·943 1879...0·095 Average...0·366 After Notification. 1880 ..0·816 1881...0·096 1882...0·376 1883 .0·588 1884 ..0·283 Average...0·431 Last 5 Years. 1889...0·382 1890...0·888 1891...0·267 1892. 1·495 1893...0·564 Average...0·719	2s. 6d. each case. Annual average cost last 10 years, £447 5s. 3d.	Opinion of Medical Officer of Health not obtained. Dr. Harvey Littlejohn, although favourable to the continued notification of measles, does not consider it useful as a means of "checking the spread of the disease."
BIRKENHEAD ...	99,857	1882	......	Before Notification. 1874. 0·32; 1875. 0·59; 1876. 0·48; 1877. 0·10; 1878. 0·91; 1879. 0·28; 1880. 0·18; 1881. 0·58 Average..............0·43. After Notification. 1882. 0·39; 1883. 0·45; 1884. 0·44; 1885. 0·83; 1886. 0·23; 1887. 0·82; 1888. 0·14; 1889. 0·63 Average..............0·53.	......	...
BLACKPOOL	23,846	1879	......	After Notification. 1881–85. 0·25 1886–90. 0·23 1891–92. 0·20	......	I may state at once that in my opinion notification of measles is valuable, and is worth the money that is paid therefor, but must confess that it is, after whooping cough, the most difficult infectious disease that we, as health officers, have to deal with, and that in small towns and country districts notification will have more chance of doing good than in large towns.
COVENTRY	55,000	1890	......	Six years—1884–89 .... 0·50 Four ,, —1890–93 .... 0·19 During the earlier period notification was voluntary, a fee of 3s. 6d. being paid for each family notified.	......	Value of notification doubtful. The power of infection arises *before the onset of symptoms*, hence much mischief is done before the earliest notification is possible. Finds precautionary measures powerless to check the dissemination of the disease so long as schools remain open. Closure, however, cannot be resorted to until the disease has become epidemic, sufficiently so to justify the step: hence all efforts to stamp out the malady in its early stage, and thus prevent the development of an epidemic, have failed.
DARLINGTON ...	40,000	February, 1890	Because it is usually spread in schools. Children go in the initial stage with only catarrhal symptoms, when it is probably in its most infectious stage, and the disease is not notified until after the rash. Very expensive.	......	Paid a fee in each case.	......
KIDDERMINSTER	25,000	December, 1889	Notification of measles still in force.	Average number of deaths, 1884–88 .... 13 ,, ,, ,, 1889–93 9	2s. 6d. each case. Annual average cost, 1890–93, £24 14s. 6d.	We found the spread of the disease greatly retarded, the children better looked after, and, as a consequence, less deaths and far less wounded. After the first cases you can act promptly and isolate. The disease passed from school to school much slower than it did previous to notification.
NEATH	11,500	June, 1890, for 6 months	......	......	2s. 6d. each case.	My impression is that no great value is derived from the notification of measles—at any rate not the mild type at present in Neath; and that public institutions have not been protected to any marked degree.
READING	64,109	1881	......	Five years—1877–81 .... 0·29 Twelve ,, —1882–93 .... 0·52	1s. each case One fee within an interval of 30 days to the same medical man in respect to the same disease in the same house.	I do not think much good is derived from the notification of measles. The mortality from it has been greater since it has been notifiable. But I think the more general school attendance has increased the spread of measles, and I think this increase would probably have been greater but for notification, because I think the control over school attendance has a little influence in checking it, and I think in a few instances early closure of infants' departments has exercised some check on the spread of its infection.
SLEAFORD ...	17,910	1890	Abandoned same year, because of the expense primarily and the uselessness secondarily.	No records.	2s. 6d. each case. Annual, £26 7s. 6d.	Absolutely without value. Parents do not fear measles, but rather wish their children to have the disease and "get it over."
TODMORDEN ..	24,850	1890	Abandoned at the end of 1893. Medical Officer of Health failed to see the benefit derived from notification.	......	2s. 6d. each case. Annual average cost, 1891-92-93, £27 5s.	I failed to see what benefit was derived from the inclusion of these diseases as notifiable, as few householders notified them, and they did not come under the observation of medical men until they became very prevalent, or assumed an aggravated form—when notification was too late to enable the sanitary officers to either secure the isolation of the sick, or take such precautions as could in any way prevent the spread of the diseases, which ran their course until such time as they had caught all such victims as were liable to infection.
WITHINGTON	26,100	1890	...	Five years—1885–89.............................. 0·18 Four ,, —1890–93.............................. 0·12	2s. 6d. each case. Average annual cost, about £20.	I consider that the notification of measles is of considerable value in preventing its spread. It enables me to cope with an epidemic by closing the schools of the neighbourhood in which the fever prevails at a much earlier period than would otherwise be possible in many instances. I believe the schools to act as the prime means of the spread of measles.
BOLTON ...	118,303	1877	Abandoned in 1879 on account of the *expense attending notification.*	Preceding. 1874 .... 0·44 1875 .... 1·20 1876 .... 0·27 1877 .... 0·55 Average...0·62. Following. 1878 .... 0·40 1879 .... 0·13 Average...0·27.	2s. 6d. each case. Average annual cost, 1878 and 1879, £38 11s. 4d.	The period during which notification of measles was compulsory in Bolton was too short to form an opinion.
SWANSEA	95,354	1891	Notifiable for a period of three months, and abandoned on account of the expense and doubt as to its efficiency.	......	2s. 6d. each case. Cost of notification for 3 months, £38 2s. 6d.	Not impressed favourably.

Subsequently the following proposals were put forward :—

"The Medical Officer of Health proposes that a sufficient number of the appended handbills be printed from time to time, and used in the following manner. Mr. Wyatt, the Clerk to the School Board, has kindly expressed his willingness to co-operate with the Health Department, and would distribute a large number to the School Board Officers.

"On the occurrence of measles in any district they would take these with them, and hand a bill to any parents whose children were attacked with measles or whooping cough when such illness came under their notice. They would also impress on them the necessity of carrying out the precautions mentioned in the handbill. At the same time, they would notify to the teachers concerned the occurrence of measles or whooping cough amongst their pupils, and supply them with copies of the handbill. But I propose also that a circular be addressed to the head teacher in all schools, with copies of the handbill, requesting them to see that special vigilance is exercised on the occurrence of these diseases in their schools, and in particular to notify to the Health Office when they have attained any dimensions in the school, so that further steps may be taken.

"The School Board Officers will also be requested, through Mr. Wyatt, to communicate with the Health Department if either of these diseases appear to be spreading in a school, so that an effort may be made to control such extension.

"It is further proposed that on the occurrence of a death from either disease, the Sanitary Inspector or Health Visitor shall call at the house where such death has occurred, and instruct the people in regard to the precautions to be adopted, at the same time ascertaining if there are other cases in the neighbourhood. In all such instances the schools of that neighbourhood will receive special cautions, and the handbills will be distributed where they are required.

"In this way it is hoped, with the assistance of the school officers in excluding from school children living in infected houses, that something may be done to mitigate the severity of incidence of both measles and whooping cough.

"The Inspectors and Health Visitors will receive instructions to arrange for the cleansing of houses in cases in which insanitary conditions are associated with the diseases in question.

"MEDICAL OFFICER OF HEALTH.

"The Hospitals Sub-Committee,
"May 29th, 1894."

The handbills and letters alluded to in this Report are as follows :—

PRECAUTIONS AGAINST MEASLES.

1. Measles is a very fatal disease. In the years 1891, 1892, and 1893, the total number of deaths from measles in Manchester was more than twice the number from scarlet fever.

2. It is very highly infectious, especially in the early stage, for several days before the rash appears. The early signs of the disease are coughing, sneezing, and redness of the eyes, with some degree of illness.

3. A child at school with such marks of illness should be at once sent home, and the teachers, particularly in the Infant Department, should be on the outlook for the first signs of illness if measles has made its appearance in the school or neighbourhood. Any illness in a child should then be considered sufficient reason for sending it home till the nature of the illness has become plain.

4. Anyone attacked by measles should, if possible, be placed in a separate room upstairs, with a good fire burning in the room, and the window open sufficiently to admit fresh air without allowing the room to get cold. The bed should be placed in that portion of the room, not lying between the window and the fire, in which there is least draught. In summer the fire should not be large, but should not be absent. Where a separate room cannot be provided the same procedure should be carried out.

5. In view of the high mortality from the disease, parents are advised in every instance to seek medical advice.

6. The children at home not attacked should not go to school or other place of meeting for a month after the appearance of the eruption in the first child, and, if subsequent cases occur, not until a month after the appearance of the eruption in the last child attacked.

7. Where a case of measles has occurred in a house, a careful outlook should be kept on the other children, so that, on the first appearance of illness, they may be kept at home and properly treated.

8. When a child at any house is suffering from measles, no neighbour's child, and no neighbour accompanied by a child, must be admitted; nor should the child ill with measles be allowed to play with other children for a month after the appearance of the rash.

9. Before the child attacked returns to school the following measures should be carried out. All articles of clothing worn by the sick child, and the bedding and hangings of the sick room, should be washed and put out to air for some days. All washable articles of furniture in the room should be washed. The walls of the rooms, if papered, should be cleaned down with dough, the dough being at once burned. If not papered, the walls should be lime-washed. In all cases the ceiling should be lime-washed. The floors should be thoroughly scrubbed. The window should be left open for several days, and the window curtains removed so as to admit as much light as possible. The skin of the child who has been ill should be thoroughly cleansed by several washings with soap and warm water.

Public Health Office,
Town Hall, Manchester,
May 28th, 1894.

MEDICAL OFFICER OF HEALTH

PRECAUTIONS AGAINST WHOOPING COUGH.

1. Whooping cough is a very fatal disease. In the years 1891, 1892, and 1893, the deaths from whooping cough in Manchester were nearly three times the number of those due to scarlet fever.

2. It is highly infectious, and, when fully developed, is characterised by the well-known crowing sound. At the commencement of the disease there may be nothing to indicate that it is coming on, except some degree of feverish cold, taken along with the fact that it has been preceded by whooping cough in other children. Sometimes frequency of cough announces its approach.

3. A child at school, in whom there is reason to believe that whooping cough is showing itself, or who has the disease well marked, should be at once sent home, and the teachers should be on the outlook for fresh cases. Any illness in the Infant Department following on the occurrence of whooping cough should be viewed with suspicion, and the child sent home.

4. In looking for the occurrence of whooping cough among children under their charge, teachers are particularly requested to observe that this disease may be ushered in by no observable symptoms, except perhaps coughing, and that any appearance of illness should be considered sufficient ground for sending a child home for a few days once the disease has made its appearance in the school.

5. A child attacked by whooping cough should, if possible, be isolated in a room upstairs, with a fire burning in the room, and the window opened sufficiently to admit fresh air without allowing the room to get cold.

6. The other children in the house must not go to school until the "whoops" have ceased to be perceived.

7. When one child in a household has been attacked with whooping cough, the others should be watched, and any appearance of illness, especially with coughing, should be regarded as probably indicating whooping cough, while the child should be treated in the same manner as the one first attacked.

8. When a child at any house is suffering from whooping cough, no child, or neighbour accompanied by a child, must be admitted into the house; nor must the child with whooping cough be allowed to play with other children until the "whoops" have ceased to be observed.

9. The matter coughed or spat up by the sick child must be regarded as infectious, and should be received into pieces of rag, which should be at once burned. Discharges from the nostrils should be treated in the same manner.

10. In all cases of whooping cough, medical advice should be obtained until the child is out of danger.

Public Health Office,
Town Hall, Manchester,
May 28th, 1894.

Medical Officer of Health.

Public Health Office,
Town Hall, Manchester,

.... 18 ....

NOTICE.

Children from ....

in which house there is now or has lately been a child suffering from ....

must not go to any school, or other place where children meet together, till weeks have elapsed from the commencement of the last case of ....

in the house.

....

Medical Officer of Health.

Public Health Office,
Town Hall, Manchester,

....18..........

To the School ....

....*School.*

....

....

There is a case of ....

at..

You are therefore requested not to admit to school children living in that house till after the..

....

....

Medical Officer of Health.

WHOOPING COUGH.

The figures giving the whooping cough mortality for 1894 are as follows :—

WHOOPING COUGH MORTALITY.—ANNUAL RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales	0·43	0·48	0·47	0·46	0·34	**0·44**	0·39
33 Great Towns	0·50	0·62	0·64	0·57	0·48	**0·56**	0·48
London	0·43	0·77	0·68	0·59	0·54	**0·60**	0·48
City of Manchester...	0·45	0·37	1·02	0·72	0·46	**0·60**	0·55
Manchester Township ...	...	...	1·24	0·86	0·64	**0·91**	0·55
North Manchester	...	...	0·72	0·60	0·28	**0·53**	0·45
South Manchester	...	...	1·04	0·69	0·45	**0·73**	0·60
50 Smaller Towns.........	0·43	0·44	0·39	...	...	**0·42**	...
67 Smaller Towns.........	...	...	...	0·49	0·31	**0·40**	0·39
Rural Districts	0·34	0·36	0·35	0·32	0·23	**0·32**	0·33

It will be seen that the average mortality in Manchester exceeds that in the 33 large towns, though not greatly.

The proposals put forward for dealing with measles and whooping cough have been fairly well carried out, and no doubt the public will in this way be gradually brought to attach more importance to the prevention of these diseases.

SCARLET FEVER.

The distribution of this disease in 1894 is shown in the following table. In the years 1891–93 the districts most severely attacked were, in order, Newton Heath, Beswick, Blackley, Openshaw, Cheetham, Crumpsall, Harpurhey. In 1894 they were Harpurhey, Cheetham, and Newton Heath. In recent years the disease has been more fatal in North than in South Manchester, but this was reversed in 1894.

SCARLET FEVER ATTACKS, 1894.

TOWNSHIPS OF MANCHESTER	ATTACKS	ATTACKRATE PER 1,000 LIVING	† CASE FATALITY, PER CENT.	REMOVALS TO HOSPITAL, PER CENT.
Ancoats	183	3·94	7·1	78·7
Central	87	2·33	9·2	77·1
St. George's	284	4·48	5·6	79·9
Cheetham	166	5·55	3·0	62·0
Crumpsall	33	3·87	...	54·5
Blackley	24	3·15	...	54·3
Harpurhey	97	9·60	6·2	71·2
Moston	10	1·70	10·0	40·0
Newton Heath	180	5·05	6·1	66·7
Bradford	99	4·57	3·0	66·7
Beswick	43	4·17	...	72·1
Clayton	18	4·81	...	55·5
Ardwick	91	2·50	6·6	56·1
Openshaw	128	4·63	3·9	38·3
Gorton (West)	114	4·33	3·5	55·3
Rusholme and Kirk...	69	3·73	4·3	50·7
Chorlton-on-Medlock..	289	4·76	5·2	59·9
Hulme	315	4·36	6·0	72·4
City of Manchester.	**2,230**	**4·27**	**5·2**	**66·0**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

A second table exhibits the number of attacks at different ages, and the percentage of fatal cases at each age:—

SCARLET FEVER, 1894.

AGES	ATTACKS	DEATHS	CASE FATALITY*
Under one year...	42	10	23·8
1 to 2 years ...	103	19	18·4
2 to 3 ,, ...	177	15	8·5
3 to 4 ,, ...	230	26	11·3
4 to 5 ,, ...	219	9	4·1
5 to 6 ,, ...	250	13	5·2
6 to 7 ,, ...	190	5	2·6
7 to 8 ,, ...	203	6	3·0
8 to 9 ,, ...	154	2	1·3
9 to 10 ,, ...	135	2	1·5
10 to 15 ,, ...	331	3	0·9
15 to 20 ,, ...	93	3	3·2
20 to 25 ,, ...	50	1	2·0
25 to 35 ,, ...	35	...	...
35 to 45 ,, ...	13	1	7·7
Over 45 ,, ...	5	...	...
All ages............	2,230	115	5·2

* The figures in this column are the actual proportions of fatal cases to the attacks at those ages.

In his Report, Dr. Tatham calls attention to the low rate of mortality in 1891–93 under 1 year of age, remarking that the mortality is usually highest in the earlier periods of life. The mortality in 1894 redresses the balance, and places the total rates for 1891–94 in the usual order, as may be seen from the following figures :—

SCARLET FEVER, 1891, 1892, 1893, AND 1894.

AGES	ATTACKS	DEATHS	CASE FATALITY
Under one year...	111	20	18·0
1 to 2 years ...	329	58	17·6
2 to 3 " ...	554	81	14·6
3 to 4 " ...	740	97	13·1
4 to 5 " ...	734	68	9·3
5 to 6 " ...	749	54	7·2
6 to 7 " ...	651	31	4·8
7 to 8 " ...	588	26	4·4
8 to 9 " ...	473	10	2·1
9 to 10 " ...	389	10	2·6
10 to 15 " ...	1,076	23	2·1
15 to 20 " ...	351	6	1·7
20 to 25 " ...	148	5	3·4
25 to 35 " ...	127	...	...
35 to 45 " ...	35	3	8·6
Over 45 " ...	15	...	...
All ages............	7,070	492	7·0

It is evident that any saving effected in the number of attacks of young children is also a saving of life. Unquestionably, prompt isolation of cases of scarlet fever in hospital will largely prevent infants from being attacked.

Very young children do not possess a high susceptibility to the infective element of scarlet fever, and their risk of attack is therefore clearly diminished by the speedy removal of those who have a greater degree of susceptibility. The total number of cases reported in 1894 was large, although not much larger in proportion than that of the twelve notification towns. The mean death-rate from scarlet fever of the five years, 1889-93, is considerably above that of the 33 great towns, and still more in excess of that of London. In 1894, however, the death-rate in Manchester was the same as that of London, and a trifle only above that of the 33 large towns.

The death-rate from scarlet fever is greatly dependent on the type of disease prevailing in a particular year, but there can be no doubt that a high proportion of cases isolated in hospital tends to produce a milder type of disease, and to distribute the incidence of the disease in any locality over a longer period of time. In 1894 the proportion of the cases removed to hospital to all the cases notified was 66 per cent., as against 59 per cent. in the years 1891-93. The latter proportion was itself much higher than had prevailed in previous years.

Scarlet fever is by no means a slight disease. It does not, indeed, exact the same immediate mortality in proportion to the number of cases as enteric fever or smallpox, but it is apt to leave very dangerous conditions behind it, such as inflammation of the middle ear, which may result at a subsequent time in fatal brain disease, heart disease, and, though less frequently, kidney disease. For this reason also it is well that the public are availing themselves so largely of the Fever Hospital, where the children are tended by skilled nurses.

A comparison of the attack rates and of the death-rates from scarlet fever with those in other localities is given in the following tables :—

SCARLET FEVER ATTACKS.—RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
Twelve Notification Towns*...	4·51	4·77	2·95	4·55	5·19	**4·39**	4·23
City of Manchester	4·98	5·26	2·24	3·25	3·92	**3·93**	4·27
Manchester Township	4·66	5·33	1·92	3·63	2·45	**3·60**	3·77
North Manchester	5·31	4·95	2·32	4·64	5·14	**4·47**	5·02
South Manchester	5·12	5·31	2·39	4·28	4·16	**4·25**	4·16

* These are Blackburn, Bolton, Bradford, Halifax, Huddersfield, Hull, Liverpool, Oldham, Preston, Salford, Sheffield, and Warrington.

SCARLET FEVER MORTALITY.—RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales...........	0·24	0·24	0·17	0·19	0·24	**0·22**	0·17
33 Great Towns	0·33	0·33	0·18	0·25	0·29	**0·28**	0·21
London.........................	0·19	0·21	0·14	0·27	0·37	**0·24**	0·22
Manchester City...........	0·45	0·60	0·22	0·27	0·27	**0·36**	0·22
Manchester Township	...	...	0·22	0·35	0·23	**0·27**	0·26
North Manchester	...	...	0·22	0·39	0·39	**0·33**	0·18
South Manchester	...	...	0·23	0·16	0·23	**0·21**	0·22
50 Smaller Towns	0·24	0·30	0·22	...	...	**0·25**	...
67 Smaller Towns	...	...	...	0·20	0·20	**0·20**	0·16
Rural Districts.................	0·18	0·18	0·15	0·15	0·20	**0·17**	0·14

DIPHTHERIA.

Local Distribution.—The following table shows that during 1894 diphtheria was most prevalent in Newton Heath and Moston, and at a long interval in Rusholme, Crumpsall, Cheetham, and West Gorton.

Diphtheria, Membranous Croup.—Rates of Attack, 1894.

Manchester Townships	Attacks	Attack Rate per 1,000 living	† Case Fatality, per cent.	Hospital Removals, per cent.
Ancoats	27	0·58	44·4	25·9
Central	29	0·78	31·1	34·5
St. George's	52	0·82	36·5	26·9
Cheetham	34	1·14	41·1	38·2
Crumpsall	10	1·17	10·0	50·0
Blackley	3	0·39	...	66·7
Harpurhey	5	0·49	20·0	...
Moston	12	2·05	8·3	...
Newton Heath	114	3·20	19·3	19·3
Bradford	11	0·51	63·6	18·2
Beswick	6	0·58	16·7	50·0
Clayton	3	0·80	66·7	33·3
Ardwick	26	0·71	19·2	11·5
Openshaw	15	0·54	40·0	6·7
Gorton (West)	29	1·10	24·2	17·2
Rusholme and Kirk.	29	1·57	27·6	13·8
Chorlton-on-Medlock	49	0·81	26·5	14·3
Hulme	58	0·80	27·6	29·3
City of Manchester	**512**	**0·98**	**28·1**	**22·6**

† Corrected : the fatal cases are those occurring amongst the cases actually notified.

In 1891-93 the greatest prevalence was in Harpurhey, Moston, Blackley, Newton Heath, Crumpsall, Gorton, and Rusholme. In 1894 the incidence of the disease in Blackley and Harpurhey was comparatively slight.

The Attack Rate.—The number attacked per 1,000 of population was large compared with that of the twelve notification towns.

The Mortality.—The mean mortality for the five years 1889-93 was below that of London, but above that of the 33 large towns. In 1894, however, the rate was below that of the 33 large towns, and much below that of London, being nearly the same as that of the country generally.

DIPHTHERIA AND MEMB. CROUP.—RATES OF ATTACK PER 1,000 OF POPULATION.

	1889	1890	1891	1892	1893	Mean	1894
Twelve Notification Towns ...	0·70	0·70	0·46	0·53	0·54	**0·59**	0·51
City of Manchester	1·21	1·20	0·90	0·97	1·20	**1·10**	0·98
Manchester Township.........	1·15	1·25	0·79	0·95	0·90	**1·01**	0·73
North Manchester	1·65	1·03	1·35	1·23	1·45	**1·34**	1·48
South Manchester	1·09	1·21	0·72	0·84	1·25	**1·02**	0·85

DIPHTHERIA MORTALITY.—RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales	0·19	0·18	0·17	0·22	0·32	**0·22**	0·28
33 Great Towns	0·26	0·25	0·21	0·27	0·43	**0·28**	0·38
London	0·39	0·33	0·34	0·46	0·76	**0·46**	0·62
Manchester City............	0·51	0·36	0·25	0·25	0·35	**0·34**	0·29
Manchester Township.........	...	...	0·26	0·32	0·30	**0·29**	0·27
North Manchester	...	...	0·40	0·30	0·38	**0·36**	0·37
South Manchester	...	...	0·17	0·18	0·37	**0·24**	0·24
50 Smaller Towns	0·13	0·12	0·13	...	...	**0·13**	..
67 Smaller Towns	...	...	.	0·15	0·19	**0·17**	0·19
Rural Districts.................	0·16	0·15	0·15	0·16	0·24	**0·17**	0·24

In the month of March a number of cases were reported from Newton Heath. Many of these came from one school, and it became manifest that the disease was being propagated in this school. It was accordingly closed for a week, and thoroughly cleansed and disinfected. This proceeding seemed to have the effect of stopping the influence of this school in spreading the disease. While inquiring into the extension which the disease had undergone in this school, I was much struck with one consideration—applicable to all diseases in which sputum or nasal discharge plays an important part, such as diphtheria, whooping cough, measles, influenza—viz., that the school books are all collected together into one common room at the end of the day, and are distributed anew next day. Quite other children will have the books which on a previous day were used by children sickening with diphtheria, and on which infectious mucus may have been discharged. This seems to me a most dangerous arrangement, and one which requires entire overhauling. It is surely a larger evil than the re-issuing of infected library books.

Two important questions are now arising in connection with diphtheria. The first is whether arrangements ought to be made for the examination, bacteriologically, of doubtful cases of diphtheria. The diagnosis of this disease is exceedingly difficult in slight cases, and much mischief is often caused by the slight attention paid to these. Not only so, but considerable difficulties arise in the treatment of the disease. If a doubtful case is taken into the hospital it is apt to be placed there among diphtheria cases, and to contract the disease. One of the diseases which is liable to simulate diphtheria is scarlet fever, and it may thus happen that a case of diphtheria may be placed in the scarlet fever wards, or a case of scarlet fever in the diphtheria wards—in either case it may be with serious results. These difficulties may be avoided by bacteriological examination, which in New York is made in every case. In that city, each practitioner is furnished with certain materials prepared in the bacteriological laboratory, by means of which he can convey with adequate precautions matter from the throat of the suspected case. This matter is sent to the bacteriological laboratory, and is there inoculated on a suitable soil. Within 24 hours of receipt of the material it is possible to tell whether the case has really been one of diphtheria. It is evident that in this way information most valuable both for the protection of households and for isolation in hospital may be obtained. I would recommend that arrangements be made by the Corporation for the bacteriological examination of cases of diphtheria.

The second question is whether cases treated in hospital should have the benefit of the new treatment with antitoxic serum, or, rather, whether the new method of treatment possesses such value that it would be greatly to the interest of the children to be removed to hospital in order that they may be submitted to this method of treatment. It is, perhaps, rather too soon to answer this question very positively; but, as far as the evidence already obtained goes, there seems reason for believing that benefit has been derived from the antitoxic treatment, and that it is, therefore, on this score, an advantage to have cases of diphtheria taken to Monsall Hospital.

It will be seen, on comparing the tables giving the age distribution of cases of diphtheria and scarlet fever, that the proportion of cases of children under one year of age to older children is much the same for both diseases, although at ages above 15 there is a relatively larger number of cases of diphtheria.

DIPHTHERIA, MEMBRANOUS CROUP, 1894.

AGES	ATTACKS	DEATHS	CASE FATALITY, PER CENT.
Under one year...	17	10	58·8
1 to 2 years ...	46	30	65·2
2 to 3 ,, ...	45	24	53·3
3 to 4 ,, ...	51	28	54·9
4 to 5 ,, ...	28	17	60·7
5 to 6 ,, ...	38	16	42·1
6 to 7 ,, ...	17	1	5·9
7 to 8 ,, ...	19	3	15·8
8 to 9 ,, ...	20	5	25·0
9 to 10 ,, ...	13	1	7·7
10 to 15 ,, ...	55	7	12·7
15 to 20 ,, ...	53	...	...
20 to 25 ,, ...	40	...	...
25 to 35 ,, ...	45	2	4·4
35 to 45 ,, ...	17	...	...
Over 45 ,, ...	8	...	...
All ages............	512	144	28·1

This general accord at early ages probably arises, in part, from the fact that many cases looked on as diphtheritic are really scarlet fever. Indeed it is the difficulty of distinguishing between the diseases which gives to the bacteriological methods their peculiar value. Like scarlet fever, diphtheria exacts a disproportionately high mortality at early ages, so that efforts put forth to remove and isolate the first cases of the disease occurring in a household are amply justified, and likely to be amply rewarded.

ENTERIC FEVER.

It will be seen, on a comparison of the following table with that given at page 53 of Dr. Tatham's Report, that the relative amount of typhoid fever in the different districts varies very considerably from year to year.

Enteric Fever Attacks, 1894.

Townships of Manchester	Attacks	Attack Rate per 1,000 living	† Case Fatality, per cent.	Removals to Hospital, per cent.
Ancoats	51	1·10	25·5	68·6
Central	44	1·18	22·7	68·2
St. George's	58	0·92	15·5	69·0
Cheetham	27	0·90	22·2	51·8
Crumpsall	6	0·70	16·7	50·0
Blackley	5	0·66	40·0	20·0
Harpurhey	8	0·79	12·5	62·5
Moston	3	0·51	...	33·3
Newton Heath.........	25	0·70	12·0	40·0
Bradford	11	0·51	27·3	27·3
Beswick	9	0·87	22·2	33·3
Clayton	4	1·07	25·0	...
Ardwick	26	0·71	19·2	57·7
Openshaw..............	23	0·83	21·7	21·7
Gorton (West)	44	1·67	11·4	52·3
Rusholme and Kirk.	12	0·65	16·7	33·3
Chorlton-on-Medlock.	39	0·64	18·0	33·3
Hulme	65	0·90	23·1	60·0
City of Manchester	**460**	**0·88**	**19·6**	**53·0**

† Corrected : the fatal cases are those occurring amongst the cases actually notified.

Nevertheless, in two districts—viz., West Gorton and the Central Division of the Manchester Township—the cases of typhoid fever show the highest percentage per 1,000 living both in 1891 to 1893 and in 1894. We must infer that there are probably special causes in these districts determining the excessive amount of enteric fever. It will be seen that enteric fever is not most prevalent in those districts which suffer most from summer diarrhœa. The causes of typhoid fever are, in fact, much more complex than those of summer diarrhœa. An excess of disease from enteric may arise from some persistent centres of infection, or from special defects in the water supply, or from some exceptionally bad milk supply. It is, however, probable that the first of these is the chief factor in this instance.

On reference to the following tables, it will be seen that the attack rate and mortality from typhoid fever in Manchester were not *exceptionally* high in 1894.

ENTERIC FEVER SICKNESS.—RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
Twelve Notification Towns...	1·27	1·01	1·09	0·90	1·85	**1·22**	1·32
City of Manchester	1·09	1·12	1·50	1·19	1·19	**1·22**	0·88
Manchester Township.........	1·12	1·07	1·37	1·18	0·93	**1·13**	1·04
North Manchester	1·35	0·99	1·36	0·94	1·08	**1·14**	0·73
South Manchester	0·98	1·21	1·65	1·33	1·42	**1·32**	0·86

ENTERIC FEVER, 1894.

AGES	ATTACKS	DEATHS	CASE FATALITY, PER CENT.
Under one year...	1	...	...
1 to 2 years ...	4	1	25·0
2 to 3 ,, ...	5	...	...
3 to 4 ,, ...	4	...	...
4 to 5 ,, ...	6	1	16·7
5 to 6 ,, ...	10	1	10·0
6 to 7 ,, ...	7	1	14·3
7 to 8 ,, ...	11	2	18·2
8 to 9 ,, ...	14	...	...
9 to 10 ,, ...	14	1	7·1
10 to 15 ,, ...	82	13	15·9
15 to 20 ,, ...	81	18	22·2
20 to 25 ,, ...	74	9	12·2
25 to 30 ,, ...	67	20	29·9
35 to 45 ,, ...	45	12	26·7
Over 45 ,, ...	35	11	31·4
All ages............	460	90	19·6

MORTALITY FROM ENTERIC FEVER.—RATE PER 1,000 LIVING.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales	0·18	0·18	0·17	0·14	0·23	**0·18**	0·16
London..........................	0·13	0·15	0·13	0·10	0·16	**0·13**	0·15
Dublin	0·65	0·48	0·53	0·38	0·80	**0·57**	0·42
City of Manchester	0·31	0·27	0·37	0·24	0·25	**0·29**	0·17
Manchester Township.........	...	...	0·40	0·24	0·18	**0·27**	0·23
North Manchester	...	...	0·29	0·25	0·27	**0·27**	0·14
South Manchester	...	...	0·40	0·24	0·27	**0·30**	0·16

This may have been due to the adoption of special measures of precaution. Whenever a case of typhoid fever is notified as not fit to be removed to the hospital, a special pail, provided with a lid and charged with disinfectants, is at once sent to the house, in which only the excreta of the person suffering from typhoid fever are placed. The following label is affixed to the pail:—

NOTICE.

This pail to be used for the Excreta of the sick person only, and the lid not to be taken off except for the purpose of pouring in Excreta.

Thus, a considerable amount of infective matter is removed from any possibility of inflicting harm. The contents of the pail are removed to Holt Town, and subjected to such processes there as must render them innocuous. There is reason to believe that the contents of the bowels do not contain the specific infectious matter of this disease for some nine days after the beginning of the illness, so that there is every reason to expect benefit from the precaution adopted. There is good reason for believing that enteric excreta placed in the common pail may sometimes cause the disease, and there can be no doubt whatever that such excreta in a midden privy are a source of serious danger.

A marked reduction has been gradually taking place in the mortality from enteric fever in this and in some other countries, as can be seen from the accompanying table.

DEATH-RATE FROM ENTERIC FEVER PER 1,000,000 OF THE POPULATION.

Year	England	London	Manchester *	Prussia †	Berlin †
1871	371	267	450	...	...
1872	377	242	400	...	...
1873	376	269	460	...	...
1874	374	256	390	...	...
1875	371	235	440	...	...
1876	309	217	420	...	...
1877	279	251	290	...	...
1878	306	283	310	...	...
1879	231	229	180	498	296
1880	261	186	260	537	506
1881	212	254	170	544	340
1882	229	252	250	488	356
1883	228	247	200	453	221
1884	236	234	190	443	241
1885	175	150	170	340	214
1886	184	154	290	314	181
1887	185	151	310	264	193
1888	172	169	330	231	188
1889	176	130	310	240	290
1890	179	146	270	204	143
1891	168	132	370	200	166
1892	137	102	240	204	137
1893	229	161	250	171	160

* The rates for the years previous to 1891 are for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent Manchester.

† For the figures relating to Prussia and Berlin I am indebted to Dr. Pistor, Medical Officer of Health to Berlin.

It will be seen that a drop occurred in the enteric fever death-rate in Manchester about the year 1881. No steady decrease has, however, since then been apparent. Manchester has thus not shared that improvement which is so manifest in the enteric death-rate in England and in Prussia, as well as in London and Berlin. What has caused the very marked improvement elsewhere which this table reveals?

It might reasonably be supposed that with the great attention which has been given in recent times to the application of remedies which have the effect of inducing sleep and allaying nervous irritability, the improvement manifested would be attributable in some degree to improved methods of treatment. The question implied in this supposition could only be answered by an appeal to the proportion of recoveries in a large number of hospitals. I have been favoured with statistics of the proportion of recoveries in the fever hospitals of the following centres of population, and they do not seem, taken as a whole, to admit of the supposition that any marked steady improvement has occurred, either in the type of the disease or in the results of treatment.

Birkenhead
Bradford
Edinburgh
Glasgow
Halifax
Huddersfield
Hull
Leicester
London
Middlesborough
Newcastle-upon-Tyne
Nottingham
Oldham
Portsmouth
Rochdale
Salford
Sheffield
South Shields
Stockport
Sunderland
Swansea

The great general improvement in typhoid fever mortality which has undoubtedly occurred must be ascribed therefore to diminished number of cases, which must in turn be due to preventive measures. Among the more important of these are improvements in water supplies, in drainage, and in the removal of excreta. The investigations of the Local Government Board and the enlightened action of Local Sanitary Authorities have no doubt effected the change, and will continue still further to diminish this disease.

In Manchester there is nothing further to be looked for in respect of the water supply, so far at all events as our present knowledge goes; but in regard to the condition of the drainage, and the methods of excreta removal, much improvement may be hoped.

SMALLPOX.

During the year 1894 the outbreak of smallpox, which occasioned so much embarrassment in 1893, continued to prevail. It will be seen on reference to the proportion of attacks in the different districts that the disease was most prevalent in Central and North Manchester; while a study of the weekly maps shows that, as regards Central Manchester, the incidence of the disease was heaviest on that part of the district containing the largest proportion of common lodging-houses. The case fatality per cent. is seen to be remarkably low, especially in 1892, and for the cases treated at Clayton Vale Hospital. Cases not smallpox are not included in these figures.

Smallpox Attacks, 1892–93–94.

Townships of Manchester	Attacks	Attack Rate per 1,000 living	Case Fatality per cent.	Removals to Hospital. Number
Ancoats	133	0·95	6·77	133
Central	96	0·85	4·17	96
St. George's	284	1·50	7·75	279
Cheetham	28	0·32	14·29	28
Crumpsall	16	0·65	18·75	16
Blackley	9	0·40	11·11	9
Harpurhey	24	0·83	8·33	24
Moston	27	1·59	11·11	26
Newton	197	1·87	6·09	197
Bradford	14	0·22	7·14	14
Beswick	6	0·20	...	6
Clayton	...	...	...	...
Ardwick	20	0·18	...	20
Openshaw	9	0·11	...	9
Gorton West	25	0·32	8·00	24
Rusholme and Kirk.	5	0·09	20·00	5
Chorlton-on-Medlock	45	0·25	8·89	41
Hulme	69	0·32	4·35	69
City of Manchester.	**1,007**	**0·65**	**7·06**	**996**

Smallpox Attacks, 1892.

Townships of Manchester	Attacks	Attack Rate per 1,000 living	Case Fatality per cent.	Removals to Hospital. Number
Ancoats	6	0·13	...	6
Central	10	0·26	...	10
St. George's	38	0·60	5·26	38
Cheetham	6	0·21	...	6
Crumpsall	...	...	...	...
Blackley	...	...	...	...
Harpurhey	...	...	...	...
Moston	...	...	...	...
Newton	32	0·92	3·12	32
Bradford	1	0·05	...	1
Beswick	...	...	...	...
Clayton	...	...	...	...
Ardwick	...	...	...	...
Openshaw	...	...	...	...
Gorton West	7	0·27	...	6
Rusholme and Kirk.	...	...	...	...
Chorlton-on-Medlock	1	0·02	...	1
Hulme	17	0·23	5·88	17
City of Manchester.	**118**	**0·23**	**3·39**	**117**

SMALLPOX ATTACKS, 1893.

TOWNSHIPS OF MANCHESTER	ATTACKS	ATTACK RATE PER 1,000 LIVING	CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL. NUMBER
Ancoats	92	1·97	8·70	92
Central	54	1·43	5·55	54
St. George's	185	2·93	7·57	182
Cheetham	21	0·71	19·05	21
Crumpsall	12	1·46	16·67	12
Blackley	5	0·67	...	5
Harpurhey	12	1·25	16·67	12
Moston	26	4·60	7·69	25
Newton	90	2·56	8·89	90
Bradford..................	5	0·24	...	5
Beswick	4	0·39	...	4
Clayton	...	...	...	...
Ardwick	13	0·36	...	13
Openshaw	9	0·34	...	9
Gorton West	5	0·19	...	5
Rusholme and Kirk. ...	5	0·28	20·00	5
Chorlton-on-Medlock ..	24	0·40	4·17	21
Hulme	45	0·62	4·44	45
City of Manchester.	**607**	**1·16**	**7·74**	**600**

SMALLPOX ATTACKS, 1894.

TOWNSHIPS OF MANCHESTER	ATTACKS	ATTACK RATE PER 1,000 LIVING	CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL. NUMBER
Ancoats	35	0·75	2·86	35
Central	32	0·86	3·12	32
St. George's	61	0·96	9·84	59
Cheetham	1	0·03	...	1
Crumpsall	4	0·47	25·00	4
Blackley	4	0·53	25·00	4
Harpurhey	12	1·19	...	12
Moston	1	0·17	100·00	1
Newton	75	2·11	4·00	75
Bradford..................	8	0·37	12·50	8
Beswick	2	0·19	...	2
Clayton	...	...	...	...
Ardwick	7	0·19	...	7
Openshaw	...	...	...	...
Gorton West	13	0·49	15·39	13
Rusholme and Kirk. ...	...	...	...	...
Chorlton-on-Medlock ..	20	0·33	15·00	19
Hulme	7	0·10	...	7
City of Manchester.	***282**	**0·54**	**7·09**	**279**

* Of these, 122 were treated entirely at Clayton Vale Hospital, with only 5 deaths, giving a case mortality just over 4 per cent. ; of 12 cases from outside districts, 1 died.

Smallpox Attacks, 1892.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Week ending	Attacks	Week ending	Attacks	Week ending	Attacks	Week ending	Attacks
Jan. 9	...	April 9	1	July 9	...	Oct. 8	5
,, 16	...	,, 16	1	,, 16	...	,, 15	3
,, 23	...	,, 23	...	,, 23	...	,, 22	5
,, 30	...	,, 30	...	,, 30	...	,, 29	...
Feb. 6	...	May 7	...	Aug. 6	...	Nov. 5	6
,, 13	...	,, 14	...	,, 13	1	,, 12	2
,, 20	...	,, 21	...	,, 20	...	,, 19	1
,, 27	...	,, 28	...	,, 27	1	,, 26	2
Mch. 5	1	June 4	...	Sept. 3	...	Dec. 3	10
,, 12	...	,, 11	...	,, 10	3	,, 10	5
,, 19	...	,, 18	...	,, 17	2	,, 17	17
,, 26	1	,, 25	...	,, 24	2	,, 24	22
April 2	1	July 2	...	Oct. 1	5	,, 31	21
Total...	3	Total...	2	Total...	14	Total...	99

Smallpox Attacks, 1893.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Week ending	Attacks	Week ending	Attacks	Week ending	Attacks	Week ending	Attacks
Jan. 7	17	April 8	15	July 8	2	Oct. 7	...
,, 14	73	,, 15	20	,, 15	3	,, 14	...
,, 21	45	,, 22	16	,, 22	3	,, 21	...
,, 28	56	,, 29	34	,, 29	...	,, 28	...
Feb. 4	32	May 6	24	Aug. 5	2	Nov. 4	...
,, 11	18	,, 13	29	,, 12	3	,, 11	...
,, 18	23	,, 20	21	,, 19	2	,, 18	...
,, 25	30	,, 27	11	,, 26	...	,, 25	...
Mch. 4	7	June 3	13	Sept. 2	...	Dec. 2	...
,, 11	28	,, 10	12	,, 9	...	,, 9	...
,, 18	22	,, 17	11	,, 16	...	,, 16	2
,, 25	12	,, 24	7	,, 23	...	,, 23	2
April 1	11	July 1	1	,, 30	...	,, 30	...
Total...	374	Total...	214	Total...	15	Total...	4

SMALLPOX ATTACKS, 1894.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Week ending	Attacks	Week ending	Attacks	Week ending	Attacks	Week ending	Attacks
Jan. 6	2	April 7	2	July 7	8	Oct. 6	3
" 13	1	" 14	8	" 14	11	" 13	...
" 20	1	" 21	7	" 21	11	" 20	1
" 27	...	" 28	13	" 28	16	" 27	...
Feb. 3	...	May 5	3	Aug. 4	2	Nov. 3	...
" 10	1	" 12	6	" 11	1	" 10	...
" 17	3	" 19	2	" 18	2	" 17	...
" 24	1	" 26	12	" 25	2	" 24	...
Mch. 3	4	June 2	44	Sept. 1	1	Dec. 1	...
" 10	...	" 9	18	" 8	1	" 8	...
" 17	...	" 16	27	" 15	...	" 15	...
" 24	1	" 23	30	" 22	2	" 22	...
" 31	4	" 30	28	" 29	3	" 29	...
Total...	18	Total...	200	Total...	60	Total...	4

As regards North Manchester, the weekly maps show that the chief incidence was on Newton Heath and Harpurhey. The movement of tramps has undoubtedly an important influence on the propagation of the disease, and one which ought to be combated strenuously. During the year 1894, eleven reimportations of the disease occurred.

When a case of smallpox occurs in a common lodging-house it is practically impossible to get the other inmates revaccinated, and I do not believe that any legal powers would enable us to effect this. In my opinion the common lodging-house keeper should, in times of smallpox prevalence, be liable to prosecution for admitting any inmate who could not produce evidence of recent successful vaccination, or of revaccination sufficient for protection. So far as the spread of this disease is concerned, the public are entitled to protection against the disease-propagating power of the inhabitants of lodging-houses, and ought to receive such protection.

This, however, is not the only—and I doubt if it is the chief—means by which smallpox is propagated. The following significant sentence occurs in Dr. Tatham's Report :—

"Although this disease was prevalent throughout the year 1891 in many of "the towns and districts of Lancashire and Yorkshire, the cases imported into "Manchester during the year did not exceed two, and as these were promptly "reported and isolated, the disease did not obtain a foothold in the City."

Under certain circumstances, however, the movement of tramps may acquire a very potent influence for harm, and subsequent to the first of June a considerable prevalence of smallpox occurred which could only be referred to such movement through the City, crowded as it was at the time of the Queen's visit.

Another outburst, however, occurred on and after May 24th which could not be ascribed to this cause. Simultaneously with this, five cases occurred in different parts of Monsall Hospital amongst the fever patients. It was felt that the patients suffering from other diseases ought not to be exposed to the risk of contracting smallpox, and accordingly the buildings at Clayton Vale which had been used as a Smallpox Convalescent Hospital in 1893 were rapidly prepared by the equipment of another ward, and the construction of a mortuary, bath, and reception rooms for the reception of new cases of the disease. The wards were opened on June 18th, and all fresh cases, as well as the recent and severe cases in Monsall Hospital, were conveyed to these wards. It was found necessary, however, to utilise the pavilions at Monsall Hospital for the reception of convalescents, a proceeding which I believe to be void of danger to the other inmates. The cases treated at Clayton Vale Hospital were all oiled with carbolic oil during the acute stage of the disease. After these measures were carried out a rapid subsidence took place in the outbreak.

The arrangements at Clayton Vale for the destruction of infective elements are tolerably complete. All liquids are boiled. The solid excreta are taken to Holt Town, and there subjected to destructive processes. It was hoped by means of oiling to check aerial conveyance. One circumstance proved somewhat embarrassing. A few of the patients developed scarlet fever in the hospital, and the absence of isolation wards was very severely felt. Indeed, had it not been for the pavilions at Monsall Hospital, it would have been absolutely necessary to provide isolation wards. I am of opinion that Clayton Vale may be profitably used as a reserve hospital for diseases other than smallpox, and that, for efficiency, isolation wards are urgently needed. An element of great importance in the spread of smallpox is the difficulty of recognising slight cases of the disease. It is not alone the people themselves who find this a difficulty, but the medical attendants are frequently mistaken. During 1894, 63 persons were reported as suffering from smallpox who were in reality affected by quite a different disease. To some extent this may be regarded as a mark of confidence in the Sanitary Authority, and as indicating that the medical attendants do not hesitate to report when there is the slightest suspicion of smallpox. Unfortunately, however, cases also occur when the disease is smallpox, and when it is not reported. It is, I think, an urgent duty of educational bodies like the Medical School in Manchester to lose no opportunity of having instruction given in the diagnosis of smallpox, as it is the interest of the Sanitary Authority to provide facilities for such instruction. It would, of course, be necessary that a "practical" acquaintance with infectious diseases should be shown at medical examinations.

I have found it necessary in the absence of isolation wards at Clayton Hospital to see the cases before removal, so as to obviate the inconvenience arising from this deficiency as far as practicable.

The following figures give the vaccination particulars of Manchester cases of smallpox admitted into the hospitals in 1892, 1893, and 1894.

SMALLPOX TREATED IN HOSPITAL, 1892–93–94.

Table showing the Percentage of Deaths in cases of Smallpox, Vaccinated, Unvaccinated, and with no marks of Vaccination, at Groups of Ages.

	ALL AGES						0—5						5—15						15—25					
	Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful	
	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths
1892–93–94	841	34	102	27	53	7	1	...	25	8	1	...	86	...	35	7	11	...	262	2	23	5	9	1
Case fatality per cent.	4·04		26·47		13·21		...		32·00		...		...		20·00		...		0·76		21·74		11·11	

	25—45						45—65						65 AND UPWARDS					
	Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful	
	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths
1892–93–94	422	26	16	5	19	4	65	6	2	2	11	1	5	...	1	...	2	1
Case fatality per cent.	6·16		31·25		21·05		9·23		100·00		9·09		...		...		50·00	

From these tables it is seen that in the years 1892–94 the chief incidence of the disease is on vaccinated adults, and that a considerable part of the mortality also falls on these. The unvaccinated mortality rate is highest at ages 0–5, and diminishes with advancing years. There is no mortality amongst vaccinated persons up to the age of 15. The relative mortalities in the vaccinated and unvaccinated cases is shown in the second table, which suggests that about the age of 15 all persons should be revaccinated, and again at the age of 30.

It is, perhaps, unnecessary to keep repeating the old lessons, which every fresh statement of the actual facts of vaccination reinforces, and the figures given above are sufficiently eloquent. I have elsewhere shown how potent a factor the revaccination of families is in checking the extension of the disease after the occurrence of a first case of smallpox in a household. Unfortunately there is a growing disposition to decline this most necessary precaution, which, however, can usually be overcome, except in the case of common and similar lodging-houses.

With a view to assist the Sanitary Inspectors in investigating the origin of cases of smallpox, the following memorandum was placed in their hands :—

"*Some points in the Investigation of Smallpox Cases, and as to Procedures*
"*to be Adopted.*

"1. When a case of smallpox occurs, if the source of the disease is not evident, an effort should be made to ascertain where the patient was from the 13th to the 15th day before the eruption appeared; and, as far as possible, his movements should be completely traced.

"2. It is, therefore, necessary to record, with as much precision as possible, the exact time of the appearance of the smallpox eruption.

"3. If two or more cases occur simultaneously, or about the same time in a house, it will be found, almost always, that there has been a previous case in the same house. Sometimes no trace of the disease will remain, but from a fortnight to three weeks before the occurrence of the second case, some member of the family will have had an illness, followed by an eruption on the face and arms, or on the face only. The eruption may disappear entirely in two or three days, leaving no trace. Generally, however, traces will remain.

"4. In all cases enquiry should be made as to whether any member of the family was ill a fortnight to three weeks before the appearance of eruption in the instance enquired into.

"5. The source of infection may, however, have been some acquaintance, or someone working at the same place, or, in the case of school children, some schoolfellow. If two or three people belonging to the same school or the

SMALLPOX ADMITTED TO HOSPITAL.

Table showing the Attack-rates and Death-rates from Smallpox per 1,000 living at Groups of Ages in Vaccinated and Unvaccinated Persons, and among those not known to be Unvaccinated but having no marks of Vaccination.

YEAR	ALL AGES						0-5						5-15						15-25						24-45						45-65						65 AND UPWARDS					
	Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful	
	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died
1892	95	2	19	2	2	...	...	...	3	1	...	...	8	...	6	...	...	...	28	...	5	1	...	...	50	1	4	...	1	...	8	1	...	...	1	...	1	...	1	...	...	...
1893	504	22	60	17	37	5	...	...	18	5	...	...	54	...	19	3	9	...	159	1	11	3	8	1	247	17	11	5	10	2	41	4	1	1	8	1	3	...	...	...	2	1
1894	242	10	23	8	14	2	1	...	4	2	1	...	24	...	10	4	2	...	75	1	7	1	1	...	125	8	1	...	8	2	16	1	1	1	2	...	1		...	...	...	...
Population at Age Groups 1892	513,196						64,335						114,521						103,699						148,682						68,839						13,120					
Population at Age Groups 1893	517,760						64,914						115,564						104,630						149,989						69,424						13,239					
Population at Age Groups 1894	522,365						65,499						116,615						105,571						151,306						70,017						13,357					
	ALL AGES						0-5						5-15						15-25						25-45						45-65						65 AND UPWARDS					
1892	0·19	0·00	0·04	0·00	0·00	...	...	...	0·05	0·02	...	...	0·07	...	0·05	...	...	...	0·27	...	0·05	0·01	...	...	0·34	0·01	0·03	...	0·01	...	0·12	0·01	...	...	0·01	...	0·08	...	0·08	...		...
1893	0·97	0·04	0·12	0·03	0·07	0·01	...	...	0·28	0·08	...	...	0·47	...	0·16	0·03	0·08	...	1·52	0·01	0·11	0·03	0·08	0·01	1·65	0·11	0·07	0·03	0·07	0·01	0·59	0·06	0·01	0·01	0·11	0·01	0·23	...	...	...	0·15	0·08
1894	0·46	0·02	0·04	0·02	0·03	0·00	0·02	...	0·06	0·03	0·02	...	0·21	...	0·09	0·03	0·02	...	0·71	0·01	0·07	0·01	0·01	...	0·83	0·05	0·01	...	0·05	0·01	0·23	0·01	0·01	0·01	0·03	...	0·07		...			...

Smallpox Sickness Rates (all Attacks), 1894.

City	Township	Northern	Southern
0·54	0·87	0·80	0·19

same workplace are taken ill about the same time, an effort should be made to ascertain whether another scholar or worker was ill, with an eruption, from a fortnight to three weeks previously.

"6. Previous cases, when found, should undergo the same precautions as recent cases.

"7. In all cases enquiry should be made, failing more direct evidence, as to whether the patient, or some other member of the family, had purchased clothing, whether new or second-hand, more than a fortnight before the appearance of eruption (or had taken such clothing out of pawn).

"8. When smallpox has occurred in a house, if the patient has not left home after the illness commenced, those living in the house will have been exposed to infection, with the addition of visitors. All those in the house, and all visitors, are liable to develop smallpox at the end of the fortnight.

"9. In this way any child in the house may develop the disease at school, and hand it on. No child should therefore return to school for 16 days after removal of the patient.

"10. In the same way, any worker in an infected house may develop the disease at work, and hand it on. No worker should, therefore, be allowed to return to work from the 13th to the 15th day after exposure to the infection of smallpox, unless successfully revaccinated within three days after the appearance of the eruption in the first case. This is somewhat difficult to work out. Let us take an illustration :

"A. B. has the eruption of smallpox on May 3rd, and is removed on May 5th. C. D. is exposed to infection for two days, 3rd to 5th. He must, therefore, unless successfully revaccinated not later than May 6th (*i.e.*, three days from first exposure), not return to work on and between the following days—13 days from the 3rd, 16th; 15 days from the 5th, 20th—that is, he must stay away on the 16th to the 20th May, inclusive. The same precaution applies to visitors who have been intimately exposed to infection.

"11. No worker who has been intimately exposed to smallpox should return to work in clothes worn during such exposure, unless these have been disinfected.

"12. All persons exposed to smallpox infection should be revaccinated within three days of the first case developing the eruption. Successful vaccination, performed early enough, is the one sufficient safeguard to the individual exposed.

"13. When the person attacked has gone about after the appearance of the eruption, pains should be taken to ascertain what persons he has come in contact with, and these should be warned. If he is a workman, intimation should be made to his fellow-workmen, so that they may have the opportunity of protecting themselves.

"14. Enquiry should in all cases be made if there is in the house any book from a library. Such book must not be returned, but handed to the Health Department. If any work has been taken in, the work must be thoroughly disinfected before being returned.

"15. No person exposed to smallpox infection in an infected house should leave it for another residence for several weeks after the occurrence of smallpox.

"16. Where such removal has taken place it should be noted, and information sent to the Medical Officer of Health if the removal is into a fresh district.

"17. Enquiry should be made in poor households if any article has been put in pawn, or removed, after the occurrence of smallpox. Such article should be recovered. No article must be subsequently put in pawn or removed.

"18. In lodging-houses, an effort should be made to ascertain who have been most intimately exposed to infection. The clothing of these should be disinfected. They should be instructed to get vaccinated.

"19. It is important that the Inspector should be able to form a rough judgment as to whether a given person has had a slight attack of smallpox. The general characteristics of slight attacks of smallpox are these:—The person attacked is seized with a feeling of illness, is chilled, and has headache, and also, in a number of instances, pain in the back, or in the stomach, or in the limbs. Sometimes there is sickness. This illness is generally well marked, and is followed at a varying interval, most commonly on the third day after the illness begins, by an eruption on the face, arms, and legs. There is usually very little or no eruption on the body in slight cases. *With the appearance of the eruption the feeling of illness disappears in mild cases.*

"Sometimes no trace is left of the eruption in three or four days. This eruption may consist of only two or three small pimples on the face. Usually, however, these slight cases leave coppery round marks behind them on the hands and arms.

"Where an illness of the kind described is followed after two days by an eruption on the face, especially if there has been exposure to the infection of smallpox, there is strong reason to suspect that the case is one of smallpox, and steps should be taken to call attention to such cases, which may do much harm if overlooked.

"MEDICAL OFFICER OF HEALTH.

"Public Health Office,
"Town Hall, Manchester,
"May 7th, 1894."

DIARRHŒA.

This is the most fatal of all the zymotic diseases. 375 deaths occurred from this cause in 1894, of which 230 were under one year of age. The death-rate per 1,000 living was much below the average, as may be seen from the accompanying table. But the proportionate mortality to that of England and Wales generally is over the average. The low mortality was, in fact, an accident of season.

Diarrhœa Mortality.—Annual Rate per 1,000 living.

	1889	1890	1891	1892	1893	Mean	1894
England and Wales	0·65	0·61	0·47	0·48	0·96	**0·63**	0·35
33 Great Towns	0·86	0·82	0·65	0·70	1·23	**0·85**	0·50
London	0·62	0·61	0·59	0·60	0·80	**0·64**	0·41
City of Manchester	1·07	1·19	0·81	0·79	1·75	**1·12**	0·70
Manchester Township	...	...	1·08	1·08	2·22	**1·46**	1·11
North Manchester	...	...	0·70	0·68	1·49	**0·96**	0·52
South Manchester	...	...	0·69	0·67	1·59	**0·98**	0·54
50 Smaller Towns	0·74	0·64	0·53	...	...	**0·64**	...
67 Smaller Towns	...	...	...	0·57	1·24	**0·90**	0·41
Rural Districts	0·48	0·41	0·32	0·32	0·72	**0·45**	0·24

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent :—

Third Quarter of the years	Mean Temperature	Rainfall	Humidity, per cent.	Diarrhœa Mortality. Annual Rate per 1,000 living
1883	58°·1	11·0	77 %	2·26
1884	61°·4	3·6	71 %	4·00
1885	56°·8	7·3	73 %	1·56
1886	59°·1	11·4	75 %	3·42
1887	59°·0	7·7	73 %	3·38
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
Mean	**58°·3**	**9·6**	**75 %**	**2·45**
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55

The seasonal distribution of diarrhœal mortality is shown by these figures :—

	1891	1892	1893	1894
First Quarter	45	32	48	47
Second Quarter	64	36	131	55
Third Quarter	217	275	688	212
Fourth Quarter	106	75	89	61
	432	428	956	375

From the second table it will be seen that the rate of mortality corresponds generally with the mean temperature attained in the third quarter, but has no marked relation, so far as these tables go, to the amount of rainfall or to the amount of humidity per cent. More than a general correspondence with the mean temperature is not to be expected, since the point at which such temperature is attained, and its duration, also have an important influence.

Diarrhœa is a disease eminently dependent on filth conditions, and also on careless feeding. It is impossible to separate the two causes, or to assess accurately the relative amount of weight to be attached to them. If in any district the mortality from diarrhœa is exceptionally high, it would be safe to assume that both causes are in operation. The table given at page 68 of Dr. Tatham's Report is, therefore, of much interest. The position taken by the Bradford district, in which the mortality is the highest for the years 1891–93, may be usefully compared with the Inspector's account of the closets in that district (see page 18).

With a view to diminish as far as possible the mortality from this disease, a handbill was sent early in June, 1894, to every house in the City, giving instructions for the prevention of the disease (see page 119).

Instructions on infant feeding were also sent at the latter end of June, 1894, to the Registrars throughout the City, with a request that every parent who comes to register the birth of a child be supplied with a copy (see page 121).

About the middle of 1894 an inquiry was begun into the various conditions connected with each death from diarrhœa. The results are summarised later on in a table, the figures of which agree with those previously obtained by Dr. Hope, of Liverpool, and seem to point to defective feeding as the most important determining condition. These figures assuredly render instruction in the feeding of infants an urgent public duty. Nevertheless, the much higher mortality in Manchester than in neighbouring towns, in which a similar negligence of infant feeding prevails, makes it impossible to assume that this alone is concerned, and Dr. Ballard's investigations have shown that insanitary conditions are largely concerned in causing the high death-rate.

During the year 1893 a number of small outbreaks of Asiatic Cholera occurred in this country, notably at Grimsby and Cleethorpes, and it was believed on the evidence of bacteriological examination that three cases had been detected in Manchester. Considerable doubt has been thrown on the reliability of the bacteriological test, but, in spite of uncertainties, it is a valuable guide in assisting us to an early judgment on the nature of cases of choleraic diarrhœa, especially when of suspicious origin.

During the first half of 1894 cholera became fairly extensively spread over Russia, and was also somewhat prevalent in Constantinople. There was thus danger of reimportation, as well as of a recrudescence in the centres invaded in 1893. This danger was increased as the diarrhœa season advanced by the difficulty which exists in discriminating clinically between cases of choleraic diarrhœa and cases of Asiatic Cholera, a circumstance which rendered it possible that the latter disease might slip in unawares. Accordingly, the following circular letter was sent out by the Local Government Board :—

CHOLERA—NOTIFICATION OF DIARRHŒA.

Local Government Board,
Whitehall, S.W.,
16th July, 1894.

SIR,

I am directed by the Local Government Board to state that cholera, from which certain parts of Europe have never been entirely free since the summer of 1892, again shows some signs of recrudescence on the Continent. In the late summer and autumn months of 1892 and 1893 the disease reached our shores. In 1892 it failed to extend to any persons beyond those arriving in our midst from abroad. But last year it led to a number of localised outbreaks which, happily, were of trivial extent compared with previous cholera visitations to this country.

In those localities where cholera made some headway it was found that there had been antecedent diarrhœa, generally quite excessive in amount, often choleraic in type, the existence of this unusual diarrhœa being only discovered when diarrhœa was, under section 7 of the Infectious Disease (Notification) Act 1889, added to the diseases notifiable under that statute. But notification of diarrhœa was rarely, if ever, adopted until after the advent of cholera, when the information to be derived from it could not be utilised to prevent that disease from gaining a footing whilst in its least recognisable form.

> Under these circumstances, the Local Government Board have thought it desirable to remind Sanitary Authorities that the utmost vigilance should be exercised within their respective districts to control any diarrhœa which may be suspicious either in character or in amount during the present and forthcoming season. And, with a view to facilitating action in this direction, the Board would give favourable consideration to any applications that may be addressed to them for their approval to add diarrhœa to the list of notifiable diseases until the termination of the current quarter. In making any such application, each Sanitary Authority will doubtless consider how far it may be desirable, in the first instance at least, to limit notification of diarrhœa to attacks occurring over one year of age.
>
> I am, Sir,
> Your obedient Servant,
> HUGH OWEN,
> Secretary.
>
> The Clerk to the Sanitary Authority.

The above communication having been brought before the Sanitary Authority, the Medical Officer of Health was instructed to issue the following circular letter to practitioners in the City :—

Choleraic Diarrhœa.

> The Sanitary Committee, at their meeting on the 25th July, instructed the Medical Officer of Health to forward to every medical practitioner within the City a circular letter in these terms :—
>
> I am instructed by the Sanitary Committee to remind you that you are required to notify forthwith to this Office any case of Asiatic Cholera occurring in your practice in the usual manner, and to inform you that up to the end of October the usual fee of 2s. 6d. will be paid for each case of choleraic diarrhœa notified, also for each case of diarrhœa of any degree of severity occurring in any person who has recently come from a district infected with Asiatic Cholera.
>
> I am to request that you will be good enough to make such notification as soon as possible after the commencement of your attendance on the case, so that measures of disinfection and other precautions may be at once adopted.

113 such cases were notified and visited by the Inspectors, the usual measures of disinfection, &c., being carried out. In no instance was there reason to suspect the presence of Asiatic Cholera.

A memorandum had been previously prepared on the precautions requisite to be taken if Asiatic Cholera should unfortunately make its appearance, and recommendations were drawn up for the use of medical men, of householders, and of the disinfectors for the prevention of the disease. These papers were, however, not required. A list of buildings was also obtained available for conversion into temporary hospitals, on the line adopted by Dr. Cameron, of Leeds. With the two pavilions at Monsall, ample provision could thus be readily made for any amount of cholera likely to arrive, so far as isolation was concerned.

An analysis of the Inspector's investigations into the deaths from diarrhœa gives the following figures :—

Age	Male	Female	Fed by Breast	Milk Boiled	Illness New	Previously Ill	Other Cases in House	HOUSES				YARD			
								THROUGH		B.-TO-B.		LARGE		SMALL	
								Clean	Dirty	Clean	Dirty	Clean	Dirty	Clean	Dirty
Under 9 months	73	69	10	75	57	72	6	92	12	19	4	43	5	37	19
Over 9 months	56	52	...	...	48	60	9	61	14	10	7	32	5	22	12

So far as the cleanliness of the houses and yards is concerned, I must express the opinion, from the cases which I subsequently personally investigated, that the standard of cleanliness adopted is by no means a high one. Nevertheless, it is evident that the houses in which fatal diarrhœa occurred were not, as a whole, exceptionally dirty inside. Of 142 children under nine months of age who succumbed to the disease, only 10 were fed entirely at the breast. Previous conditions of bad health had a very potent influence, 72 of these infants having previously suffered from bad health, many of them doubtless from tubercular diarrhœa.

Of 108 fatal cases over nine months of age, 60 had previously suffered from illness in some form.

In only 15 instances out of 250 did second cases occur in the house. This is certainly not the behaviour of a disease infectious in the usual sense.

In 75 out of the 140 fatal cases of infantile diarrhœa, the milk used was stated to have been boiled.

ON BACK-TO-BACK HOUSES.

The well-known report of Dr. Barry and Mr. P. Gordon Smith on back-to-houses concerns itself mainly with the building of new back-to-back houses, and with the details of their construction. Nevertheless, the influence of such dwellings on the health of their inmates comes under review, and a valuable mass of statistics compiled by Dr. Tatham, then Medical Officer of Health for Salford, is incorporated in the report. While complaining of the dearth of evidence as to the effect of inhabiting such houses on the health of the inmates, they feel justified on the strength of the facts before them in enunciating the following propositions :—

> That the erection of houses upon the back-to-back principle in the way commonly practised tends to promote the huddling of houses and the consequent crowding of persons upon area to a degree which is incompatible with health.
>
> That, so far as structure is concerned, certain facilities exist in back-to-back house construction under which the efficiency of party walls may be less than in the case of through houses, but that otherwise the details of house construction generally are similar in both classes of houses.
>
> That little or no improvement has taken place in the ventilation of back-to-back houses themselves, and that this applies even in districts where, under comparatively recent regulations, not more than four or eight houses may be built in one block.
>
> That improvement in the method of excrement disposal has continuously gone on in the districts visited, but in this respect much still remains to be done. In some cases grave disadvantages to decency and health accrue from the custom still prevalent in certain districts of grouping privies in blocks at an excessive distance from the houses, a practice which is still more objectionable when each such privy has to serve the inhabitants of two or more houses.
>
> That the accommodation afforded in through houses is usually superior to that afforded in back-to-back houses of a similar extent.
>
> That the difference in the cost of construction of a through house and of a back-to-back house respectively, each affording the same accommodation, and built equally well, is very slight indeed; the advantage, such as it is, being with the back-to-back house.
>
> That it appears probable that the want of through ventilation has, *per se*, an unfavourable influence upon health, and gives rise to an increased mortality from pulmonary disease, phthisis, and diarrhœa, but that further and more exact information under this head is desirable.

The objects of this paper are, first, to consider what evidence exists of the unhealthiness of this class of dwelling; and, secondly, to explain what course of action is being pursued in Manchester in reference to them. By general consent the erection of houses in back-to-back blocks has been condemned as contrary to hygienic principles, although from time to time this position has been strenuously contested. It is maintained that the renewal of air in such houses is necessarily imperfect, and that the stagnant condition of the atmosphere is aggravated by the retention of excreta in the house. In the report already referred to, the Medical Officer of Health for Bradford (Mr. Butterfield) is quoted to the following effect from his Annual Report for 1878 :—

> During an epidemic of summer diarrhœa which prevailed in Bradford in 1878, 101 houses in which deaths had occurred were visited. Of the 101, 90 were of the back-to-back description, 2 were cellar dwellings, and 9 through houses. Of the 90 back-to-back houses, 60 fronted the street, and 30 the backyards. Why the deaths should be twice as numerous in the front houses as in the back ones, which face the privies and ashpits common to both, is not easily accounted for, unless the more ready access to the conveniences induces a more frequent and prompt removal of the excreta than is the case in the front houses. I have frequently remarked that rather than pass through the portions of streets and passages necessary to reach the proper receptacle, women will conceal excreta in some obscure corner of the premises until nightfall. The effect of thus contaminating the already sufficiently close atmosphere of a back-to-back house is of course exceedingly prejudicial to a child suffering from the effects of bad nursing and improper diet. More especially is this the case when the obscure corner before mentioned is beneath the shelf on which the milk is kept.

That this retention of excreta in back-to-back houses is a not uncommon occurrence I can personally testify. That the renewal of air in back-to-back houses is much less complete than in through houses is manifest, whether the through house is provided with a lobby or not. In the back-to-back house the circulation of air is free only in that smaller part of the living room which contains the door, window, and fire. The air in the remainder of the room is comparatively quiescent, especially if there is a closed door on the staircase. It is, no doubt, subject to eddies, which carry material particles into the quiescent portion of the room, to be there deposited. Upstairs, again, the same accumulation as well of material particles as of the gaseous products of respiration takes place in the still portion of the room, though more circulation of air occurs here owing to the custom of leaving the staircase door open. In the through house, upstairs, provided the windows and bedroom doors are left open, a free circulation of air takes place. It is true that, in the more recent blocks of back-to-back houses, these disadvantages might be largely got over. Thus, as Dr. Barry and Mr. Gordon Smith point out, if windows had been inserted in the ends of the blocks of four back-to-back houses which up to 1890 were built in Keighley, additional light and greater movement of air would have been obtained.

A further disadvantage attaching to houses built on this plan is the tendency to overcrowding which attaches to all of them. Such houses are frequently occupied by a large family, who crowd together into one imperfectly ventilated room. Under whatever circumstances overcrowding occurs, it has been amply shown to be detrimental to health, and no doubt overcrowding will occur whatever the nature of the house. But, as has been seen, the detriment resulting is greater in back-to-back than in through houses. It may be said, how are poor people of limited means to obtain ampler accommodation? Well, it is by no means the case that the limited accommodation implies limited means. If there are a large number of back-to-back houses in a district where it is highly inconvenient to live at a distance from the employment followed, it will often be impossible to get other houses; and it is astonishing what reluctance is shown to abandon the house. People leave unwillingly the scene of their earlier struggles, even though, once convenient enough, it has come to impose on them the greatest inconvenience. I have been informed that there are many people in good circumstances who continue to live on in the worst parts of Manchester from sheer inability to enjoy other surroundings. It thus happens that many large families are to be found in these dwellings who would naturally have expanded over a more roomy house.*

Then, again, by no adjustment is it possible in many cases to secure isolation, whether temporary or continued, on the occurrence of infectious disease in these houses. Human nature is so constituted that there are always a certain proportion of people to whom it is a terror to part with their sick. We should, therefore, expect an excess of infectious disease in this class of house—an expectation which, so far as mortality is concerned, is not disappointed.

When we turn from general considerations to the specific and pointed inquiry: what are the facts of back-to-back houses, and what remedies are suggested? we are on more difficult ground. In the first place, in position, structure, arrangement, and conveniences, back-to-back houses vary much amongst each other, and it would be absurd to expect the same results from inhabiting such houses built under the most recent regulations as from living in back-to-back houses erected without any regard to conditions of health. It is also a perfectly just contention that the social circumstances of the inhabitants is liable to exercise an altogether preponderant effect upon the inhabitants of houses, whether back-to-back or other. An immoral and reckless population will altogether alter the mortality rates of a district. If a district is inhabited by people of the very poorest class, they are liable to undergo a higher death-rate than the class above them in the social scale. There may thus be a very considerable difference in mortality between two rows of back-to-back houses at no great distance from each other. Differences of mortality will arise in districts from a great variety of causes, such as difference of the industries carried on by the populations inhabiting them, the character of the subsoil, the width and ventilation of the streets, and many other causes. Moreover, there are other insanitary conditions which will, to a large extent, counteract the advantages of through ventilation. Thus, houses with extremely small backyards containing a pail-closet and ash-box, and bounded by a high wall, might well be subject to influences not less injurious than those attaching to back-to-back houses; and, supposing the closet arrangements defective, the state of such houses might be, and not very rarely is, extremely bad. Further, assuming in a given district the inhabitants of a row of back-to-back houses to have been subjected to demoralising influences, such influences would almost certainly extend to the neighbouring dwellings. It might thus well happen that in certain districts the mortality would be determined in large measure, not by the character of the houses, but in a preponderating degree by the class of inhabitants.

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* This statement is founded on an examination of the census which I have had taken of back-to-back houses.

Then, again, if we were to take a City like Manchester, and compare one district with another, simply in respect to the proportion of back-to-back houses, we should fail to take account of the extremely disturbing influence introduced by common lodging-houses and other lodging-houses of a kindred character. These are aggregated to a large extent in groups, and cannot fail to exercise a considerable effect on the mortality of their respective districts. Perturbing as their influence on the death-rate must be, it must also be a partial one, since the population of these houses consists for the most part of adults. It is necessary thus fully to insist on the difficulties which interpose themselves in the path of the inquirer into the influence exerted by a particular class of dwellings, since it is manifest that some method of investigation must be instituted which will, as far as possible, eliminate them, and allow the effect of the dwelling itself to come into prominence.

There do not seem so far to have been many endeavours to ascertain by direct investigation the effect of back-to-back houses on mortality. The most notable is that made by Dr. Tatham, when Medical Officer of Health for Salford, which is given in extenso in Dr. Barry and Mr. Gordon Smith's Report. Dr. Tatham endeavoured to elucidate the subject by comparing the death-rates from all causes, from infectious diseases, from phthisis, and from lung diseases in the Registration Districts of Greengate and Regent Road in Salford. The Registration Districts are then classified according to the proportion of back-to-back houses in them, and the figures are totalled in groups, as shown in the following table:—

Table showing the Mortality Statistics from all and certain Specified Causes during the Five Years 1879–83 in Groups of Districts containing different proportions of back-to-back houses comprised within the Greengate and Regent Road Registration Sub-districts of Salford.

	Group	District	Population	All Causes		Pulmonary Diseases other than Phthisis		Phthisis		Smallpox, Measles, Scarlatina, Diphtheria, Whooping Cough, Fever, Diarrhœa		Deaths from Diseases enumerated in Columns 3–5		Deaths from Diseases not enumerated in Columns 3–5		Diarrhœa	
				Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living	Deaths Registered	Death-rate per 1,000 living
			1	2		3		4		5		6		7		8	
Greengate	I.	9 districts containing no back-to-back houses	8,713	1,199	27·5	289	6·6	123	2·8	198	4·5	610	13·9	589	13·6	62	1·42
	II.	13 districts containing an average proportion of 23 per cent. of back-to-back houses	11,749	1,719	29·2	457	7·8	195	3·3	282	4·8	934	15·9	785	13·3	91	1·55
	III.	12 districts containing an average proportion of 56 per cent. of back-to-back houses	11,405	1,738	30·5	449	7·9	203	3·6	352	6·2	1,009	17·7	729	12·8	121	2·12
		Greengate Sub-district	31,867	4,656	29·2	1,195	7·5	521	3·3	832	5·2	2,553	16·0	2,103	13·2	274	1·72
Regent Road	I.	72 districts containing no back-to-back houses	54,264	7,079	26·1	1,560	5·7	725	2·7	1,330	4·9	3,615	13·3	3,464	12·8	418	1·54
	II.	10 districts containing an average proportion of 18 per cent. of back-to-back houses	8,773	1,276	29·1	329	7·5	119	2·7	215	4·9	663	15·1	613	14·0	81	1·85
	III.	6 districts containing an average proportion of 50 per cent. of back-to-back houses	4,380	817	37·3	189	8·6	99	4·5	167	7·6	455	20·7	362	16·6	62	2·83
		Regent Road Sub-district	67,417	9,172	27·2	2,078	6·3	943	2·8	1,712	5·0	4,733	14·1	4,439	13·1	561	1·66

Enumeration District	Population Census, 1881	Deaths from all Causes, 1879-83		Deaths from Phthisis, 1879-83		Deaths from Lung Diseases, 1879-83		Deaths Registered in Five Years 1879-83 from—							Total Deaths from Diseases in Columns 9-15		Houses		
		Regis-tered	Annual Rate per 1,000 living	Regis-tered	Annual Rate per 1,000 living	Regis-tered	Annual Rate per 1,000 living	Small-pox	Measles	Scarlet Fever	Diph-theria	Whoop-ing Cough	Fever	Diar-rhœa	Regis-tered	Annual Rate per 1,000 living	Total Houses inhabited and un-inhabited	Back-to-back Houses	Percent-age of Back-to back Houses
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
			REGENT ROAD																
1	715	136	38·1	10	2·8	40	11·2	...	3	2	...	6	1	6	18	5·0	177	...	...
2	943	189	40·1	23	4·9	51	10.8	...	6	5	...	4	1	4	20	4·2	175	...	...
3	791	161	40·7	27	6·8	34	8·6	...	5	3	...	3	3	7	21	5·3	171	...	...
4	607	84	27·7	6	2·0	27	8·9	...	1	...	2	4	2	3	12	3·9	159	16	10·1
5	1,012	116	22·9	7	1·4	30	5·9	...	6	3	...	3	1	6	19	3·8	203	...	...
6	972	136	28·0	16	3·3	30	6·2	...	1	3	...	6	2	9	21	4·3	199	20	10·0
7	797	112	28·2	17	4·3	25	6·3	...	3	5	...	4	1	12	25	6·3	185	80	43·3
8	1,045	176	33·7	25	4·8	39	7·5	...	2	10	...	5	1	14	32	6·1	213	...	...
9	993	145	29·2	10	2·0	59	11·9	...	7	3	...	6	2	7	25	5·0	205	30	14·6
10	908	143	31·5	14	3·1	32	7·0	...	2	4	2	4	...	8	20	4·4	206	32	15·5
11	743	105	28·3	12	3·2	20	5·4	...	5	4	...	6	5	4	24	6·5	146	...	...
12	788	165	41·9	21	5·3	32	8·1	...	7	3	...	4	3	12	29	7·4	179	84	47·0
13	676	149	44·1	13	3·8	31	9·2	...	8	2	2	11	3	11	37	10·9	167	92	55·1
14	536	95	35·5	7	2·6	22	8·2	...	2	2	...	4	5	6	19	7·1	137	...	...
15	446	74	33·2	2	0·8	21	9·4	...	2	2	...	2	2	4	12	5·4	110	...	...
			GREENGATE																
93	971	130	26·8	10	2·1	31	6·4	...	1	3	1	5	...	6	16	3·3	216	56	25·9
94	920	140	30·4	20	4·4	38	8·3	...	2	8	...	3	4	7	24	5·2	188	62	33·0
95	811	161	39·7	17	4·2	39	9·6	...	1	8	2	5	1	13	30	7·4	193	85	44·1
96	1,037	169	32·6	10	1·9	41	7·9	2	3	3	...	8	4	10	30	5·8	175	...	...
97	1,109	178	32·1	23	4·1	49	8·8	...	7	3	...	11	6	8	35	6·3	258	158	61·3
98	948	166	35·0	21	4·4	53	11·2	...	3	7	...	5	4	2	21	4·4	206	...	...
99	749	124	33·1	19	5·1	37	9·9	...	1	2	...	4	4	13	24	6·4	145	40	27·6
100	824	121	29·4	10	2·4	30	7·3	...	...	2	1	7	3	4	17	1·4	189	12	6·4
101	685	109	31·8	7	2·0	26	7·6	...	2	...	...	7	2	9	20	5·8	148	...	...
102	1,132	193	34·1	29	5·1	47	8·3	...	6	4	1	9	1	18	39	6·9	190	33	17·4

This is a striking table (see page 66), and renders it highly probable that the mere fact of being back-to-back renders a house injurious to its inmates. But, however valuable the results obtained may be, they fall short of proof, and are open to these serious objections.

In the first place, the back-to-back houses certainly—on the whole—lie in the older and less sanitary parts of Salford, so that, in the total of districts containing no back-to-back houses, there are many that are probably much healthier than any of those containing back-to-back houses, and these will doubtless lower the total death-rates.

In the second place, when we take the tables furnished by Dr. Tatham in detail, and examine the districts adjoining those containing back-to-back houses, we find that in these also the mortalities are very high, being frequently in excess of the mortalities in the districts containing back-to-back houses.

A few examples of this will show that it is so in a striking degree; a circumstance which does, certainly, throw some doubt on the conclusions arrived at.

These are, unquestionably, serious objections to resting too confidently on the statistics obtained by comparing one district with another.

Another difficulty is the varying proportion of common and kindred lodging-houses in different districts. These and other causes introduce such discrepancies into the age constitutions of the various populations as to render it highly desirable to take account of this element in our calculations.

Nevertheless, these figures must be allowed to possess considerable value, especially in the Greengate district, in the light of the following statement in the report in reference to this district:—

> The density of the districts as a whole is very high (120·7 persons per acre in 1881), and we believe that there is little difference in this respect between the different districts comprised within it. The houses are all of a similar class, and are, as a rule, let at weekly rentals. The inhabitants are of the lower labourer and artisan type. The arrangements for securing the due circulation of air about dwellings are as a rule most efficient in those districts which contain the largest proportion of back-to-back houses, owing to their erection in short blocks. The sanitary surroundings are similar, with the exception that in the case of through houses there are a larger proportion which are exposed to stinks arising from the prevalent type of midden privy than in the case of the back-to-

back houses, the middens in the former case being as a rule situate in the backyard, in close proximity to the houses; whilst in the latter case the privies, which are few in number, are situate at the end of the blocks or rows. The back-to-back houses in all cases abut directly upon the public streets, which are paved, flagged, and kept clean under the control of the Sanitary Authority; whilst many of the through houses possess very confined backyards, which from want of periodical cleansing are frequently in an unwholesome condition. Taking all the circumstances into consideration, we are inclined to think that as regards the Greengate division, with the exception of the means for through ventilation, the back-to-back houses as a whole are in a better sanitary condition than the through houses.

The ideal method of estimating the effect of back-to-back houses on the death-rates would be, if possible, to take a number of back-to-back houses built in the same manner as a like number of through houses of similar materials and soundness of construction, inhabited by the same class of people, engaged in the same pursuits, and then to compare the fortunes of the inhabitants in the two groups. Fortunately we possess such an investigation, and although it is not on a very large scale, yet it is so admirably adapted to clear away difficulties, and so almost experimental in its conditions, that I will venture to quote freely from Mr. Herbert Jones's excellent paper in "Public Health":—

Anyone who has but the most passing acquaintance with statistics is only too well aware of the tricks that figures are in the habit of playing one, so that it is only by hemming them in and weighing them down with the most stringent rules that it is at all possible to extract from them useful and reliable information. It is no doubt within your knowledge that we have two sets of vital statistics comparing "back-to-back" and "through" houses—one compiled by Dr. Bell, of this town, in 1891; the other from figures supplied by Dr. Tatham, of Manchester, in 1888. But as the deductions drawn from these two tables are distinctly at variance, and as there are in both of them many vulnerable points, before I began to compile the following I laid down certain conditions which it seems to me must exist, or must be approached as nearly as possible, if we wish to obtain accurate and precise results.

1. The areas compared must each contain a minimum of the opposite class of house—that is to say, the back-to-back houses must have few, if any, through; and the through houses few, if any, back-to-back.

2. Each class of house must be occupied by the same class of tenant, earning as nearly as possible the same wages, and occupied in the same kind of work. It would be manifestly unfair to compare the through houses of the potters in Staffordshire with the back-to-back houses of the Bradford weavers.

3. The sanitary arrangements of each house must be identical, especially regarding the w.c. and ashpit. We cannot compare a house with a w.c. and one with an old-fashioned privy, emptied only when overflowing.

4. The building material, the soil, the aspect, and the water supply must be the same.

5. The density of population per acre and the age of the houses must approximate as nearly as possible.

6. A large number of houses must be taken, and the calculations must be spread over at least five years.

I should like to add that it is important to obtain information as precisely as possible—(*a*) as to the relative amount of pauperism in each area operated upon; (*b*) as to the number of houses that have been unoccupied during the years dealt with; (*c*) as to whether any localised epidemic has occurred in one or other of the districts; and (*d*) if either district contains a hospital or public institution, allowance must be made for deaths occurring therein.

These safeguards have all been most stringently applied to the figures I am about to review.

We have in Shipley (a township with a population of 16,000) two districts that fulfil very closely the conditions I have recited. The compact village of Saltaire, built in 1853, contains 850 houses, all of them of the through type, has a population of 4,218, with a density of 197 to the acre, and rents ranging from 3s. to 5s. per week. Then we have almost adjoining a district built between 1853 and 1870, containing exclusively back-to-back houses—874 in all, with a population of 4,155, a density of 222 to the acre, and rents ranging from 2s. 6d. to 7s. per week. All these 1,700 houses are occupied by the same class of tenants, who are engaged in the same kind of work.

The soil, the water supply, the aspect, the sanitary arrangements, and the building material are the same. The average number of paupers in the through houses is ·42 of the population, and in the back-to-back district ·47.

My statistics cover the six years from 1887 to 1892 inclusive, and taking first of all the deaths from all causes, it will be found that the average annual death-rate during those years in the whole of Shipley was 16·2. In the through houses of Saltaire in the same period it was 15·6, and in the back-to-back houses of Shipley 21·1; thus clearly showing that the death-rate of the entire district is dragged up by these back-to-back houses.

Then, when we come to specific causes of death, the zymotic death-rate was in Saltaire 1·08 in the back-to-back district, and the whole town 1·7. We have so few deaths from diarrhœa in Shipley that little can be learned from its death-rate, though we find that the back-to-back houses have nearly twice as many deaths as occur in the through houses. When we come, however, to lung diseases, we find, as we should expect, that the through houses compare most favourably with their opponents. Let us take phthisis first: In Saltaire the average death-rate was 2·7, in the back-to-back houses 3·4, and in the whole town 2·3. Other respiratory diseases (bronchitis, pneumonia, and pleurisy) gave for Saltaire 3·6, for the back-to-back houses 5·1, and for the whole district 4·0.

I am quite prepared to be told that there are back-to-back houses and back-to-back houses. And as I find upon analysing different classes of these houses that different results may be obtained according to the amount of air-space between the houses, it would be extremely unfair to those who favour this kind of dwelling if I withheld the results of my investigation. The back-to-back houses are divided into three sections: A has streets 25 yards wide, with a density of 160 persons to the acre; B has streets ten yards wide, with a density of 300 to the acre; and in C the streets are 15 yards wide, and the density is 207 to the acre. In B and C some of the streets are culs-de-sac—indeed we might say that, not only the houses, but the very streets are back-to-back. In A there are no blind streets. We find that the death-rate in A from all causes was 18·1, in B 28·1, and in C 22·5.

If we compare, then, the through houses with those back-to-back that have the greatest advantages—the A district, where the houses are 25 yards apart; where there is a density of only 160 to the acre, against 197 in Saltaire; and where the percentage of pauperism is only ·17, against ·42 in Saltaire—we find that the through houses still more than hold their own, and most noticeably in the case of respiratory diseases, the Saltaire death-rate being 3·6, and the back-to-backs 4·9.

Those who advocate back-to-back houses never tire of telling us that in drawing up comparative statistics there are so many influences to be taken into consideration other than the construction of the dwelling.

> There must be some reason, however, why the death-rates in this one group A of nearly 500 back-to-back houses should be so much higher than in the through houses of Saltaire. Can it be poverty? But there is more than double the amount of pauperism in Saltaire. Can it be the density of population? But Saltaire has 0·1 persons more per house and 37 more per acre. Is it due to the faulty sanitary arrangements? But the death-rate from diarrhœa—a disease more dependent, perhaps, than any other upon adequate drainage—curiously enough, is precisely the same in both districts. We must fall back, I think, upon the special construction of the two classes of dwellings as the primary factor in bringing about so great a disparity as I have indicated.

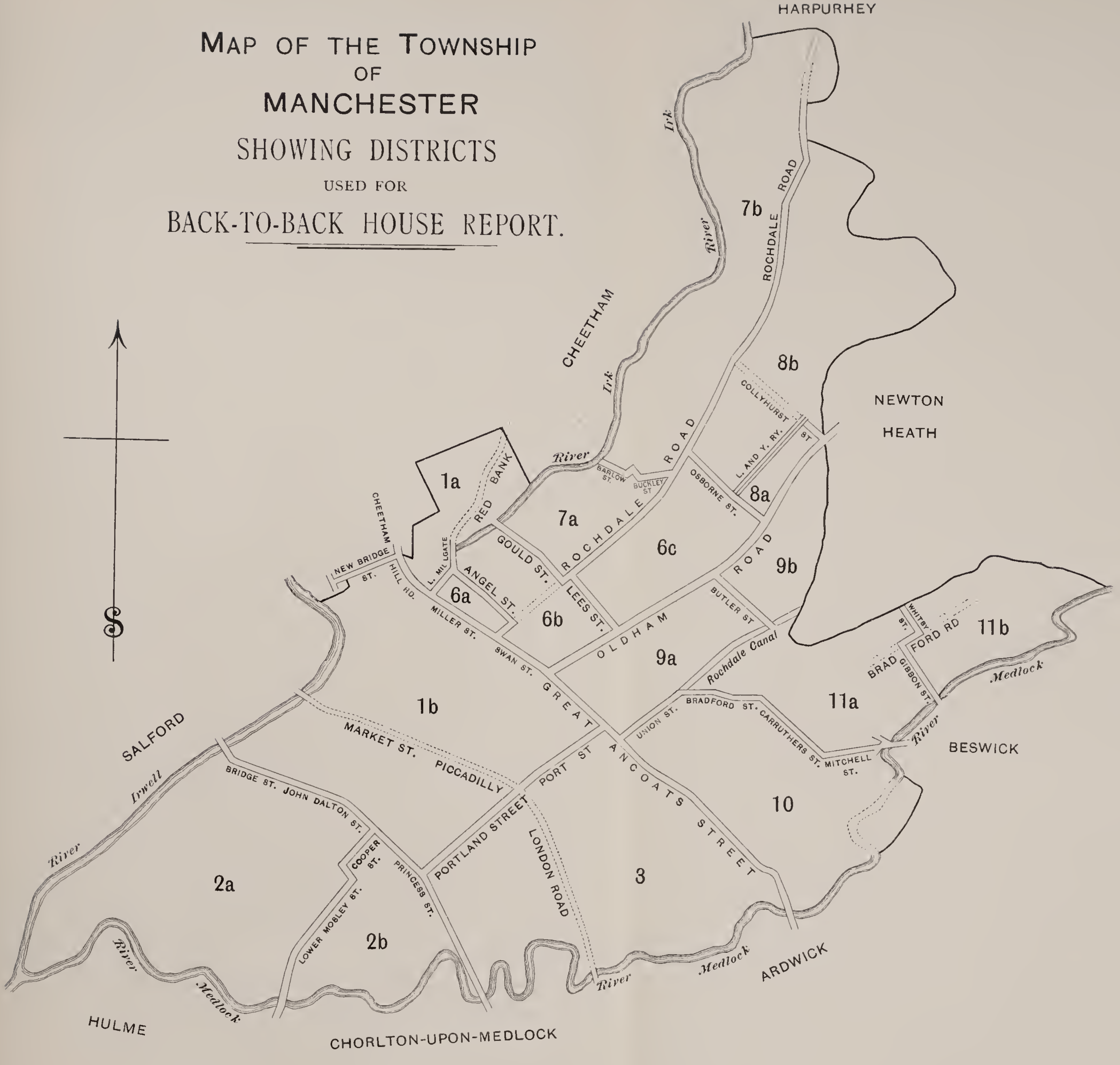
The method of investigation which I have pursued is different from either of those previously quoted. It was not possible for me, without an amount of inquiry which the conditions of health-work in Manchester did not permit, to institute such investigations into the condition of all the households in the City as would have allowed me even to approximate to the perfection of Mr. Jones's method. It is well known that considerable alterations are being carried on as regards back-to-back houses in Manchester, a circumstance which introduces some difficulties into our calculations. I have, therefore, recently had a census taken of the ages of the inhabitants now living in back-to-back houses in the Old Township of Manchester, and have had the mortalities from the diseases selected in the Local Government Board Report calculated out at different groups of ages in these dwellings, and in the whole of the districts containing them. This calculation makes the following assumptions—1st. That for each sub-district the populations of the back-to-back houses now occupied have remained unchanged since the Census. 2nd. That the operations of the Sanitary Committee have not much changed the populations of the districts. The township was, for reasons of convenience, divided up first into Inspectors' Districts, corresponding to the numbers shown in the map; and these again, for purposes of calculation, were sub-divided, so as to enable me to pick out some districts in which the inhabitants of back-to-back houses did not differ materially in their social circumstances from those living in through dwellings. By the age grouping, the difficulty introduced by the presence of a number of common lodging-houses is to a large extent got over. At all events, as far as common lodging-houses are concerned, this is so, since, in a comparison of the mortalities in the earlier years of life, these will be largely eliminated as containing very few children. The mortalities in back-to-back houses are compared with those occurring in other habitations in the same district, because any injurious influences affecting one class of house will largely affect the other. A brief description of the character of each district is appended. (See page 90.)

MAP OF THE TOWNSHIP OF MANCHESTER

SHOWING DISTRICTS

USED FOR

BACK-TO-BACK HOUSE REPORT.



HENRY BLACKLOCK & Co COLOUR PRINTERS MANCHESTER

From this it will be seen that certain portions of this area, in respect of their comparative freedom from common lodging-houses and of their similarity of social conditions, are more suitable for the purposes of this inquiry, viz. :—7a, 9a, 10, 11a, 1a, 7b, 9b, and to a less extent 3, 6c, 8a, as shown in the map.

For the purpose of getting the effect of addition, the populations of these have been added, and the mortalities reckoned separately.

The districts 2a, 6a, and 6b, owing to the prevailing lodging-house element, do not admit of useful comparison, and there is something altogether phenomenal and requiring explanation in their mortalities. Probably the extraordinary mortality in those not inhabiting back-to-back dwellings in these districts is due in large measure to overcrowding in lodging-houses, and in houses sublet in lodgings. It may also be in great measure owing to the aggregation of people in these lodging-houses before finding their way into the Union Hospital to die.* I am assured by Councillor Alexander McDougall that in spite of the great improvements which have taken place in recent years in the Old Township of Manchester, with consequent shifting of populations, there is no material alteration in the number of the inmates of the Manchester Workhouse at Crumpsall from these districts, who consist in large measure of people coming from other parts into Manchester. It is, at all events, clear that some cause is in existence other than the class of dwelling causing a high death-rate in this part of the City.

If, now, we take the statistics relating to the districts, in which a knowledge of the class of people inhabiting them would lead us to infer that a comparison of mortalities would throw light on the effect of the houses *per se* on the inhabitants, we find that there is a singular uniformity running through them. I have, therefore, thought it worth while to give the districts separately, so that the degree of uniformity may be noted, and that the reader may draw from them his own conclusions. In the first place, the absolute mortalities in the back-to-back houses are high over the four years 1891–94, being in the districts—

7a	9a	10	11a	1a	9b
39·3	44·1	46·3	34·7	20·8	36·9

They are not quite so high for the total populations in the districts containing these back-to-back houses, being—

33·4	36·3	34·5	28·5	18·2	30·4

---

* This is clearly shown to be the case in the report of the Relief Department of the Board of Guardians for the Township of Manchester, 1894.

The mere statement of these mortalities, however, shows that though the fact of the houses being back-to-back exerts an influence, there are other conditions exerting a more potent influence which are common to all the houses, and which rise and fall alike in both. Among such conditions are saturation of the soil with urine, the degree of crowding on area, and the character and habits of the people living in the district. Undoubtedly the dwellings exert a potent influence, but such influence, owing to the arrangement of the yards and passages behind through houses, is not confined to the back-to-back dwellings.

It must always be borne in mind also, in regard to the mortality in houses other than those which are back-to-back, that in the centre of the City there is a constant tendency to overcrowding in houses sublet in lodgings, which must unduly elevate the death-rate.

In order to see how far the information obtainable from the mortality statistics would bear out the selection of certain districts so far as social conditions were concerned, I have had the death-rates calculated out, with and without distribution of the deaths occurring in the institutions of the City, for the whole population living in the various districts, and for the population living in the back-to-back houses respectively. The difference in the total death-rates so obtained will give some indication as to the relative numbers of the sick poor coming from the back-to-back and other houses in the respective districts. These differences I have elsewhere named poverty-indices.

It is very striking how, in the selected districts, there is a marked excess of the poverty-indices for the whole population over those for the population of back-to-back houses in the same districts—that is to say, so far as these figures go, there is more poverty in the rest of the population than in the back-to-back houses for those districts.

In the unselected districts there are some remarkable figures, viz., for 2a, 6a, and 6b. (See Table 2.) The very high differences for these districts are truly poverty-indices, being due to the large amount of the lodging-house element in the districts.

It has to be remarked that in calculating these death-rates the populations in the various institutions have not been distributed. Such distribution was not possible in back-to-back houses, and the results would therefore not have been strictly comparable, especially at advanced ages, when a distribution of the population from the Crumpsall Workhouse would have made not a large but a distinct difference.

These figures are given in the following Tables 1 and 2 :—

TABLE 1.

Death-rates in Selected* Districts in the Township of Manchester in 1891–94 in all Houses and in Back-to-back Houses respectively.

District	All Houses				Back-to-back Houses			
	Population	Death-rates after Distribution	Death-rates without Distribution	Difference	Population	Death-rates after Distribution	Death-rates without Distribution	Difference
7a	5,952	33·4	26·6	6·8	961	39·3	33·0	6·3
9a	8,617	36·3	24·6	11·7	1,418	44·1	35·9	8·2
10	14,214	34·5	26·7	7·8	1,894	46·3	38·0	8·3
11a	10,919	28·5	23·3	5·2	2,267	34·7	30·2	4·5
1a	4,722	18·2	14·2	4·0	506	20·8	18·8	2·0
9b	8,689	30·4	24·9	5·5	773	36·9	32·7	4·2
3	13,534	28·5	21·5	7·0	1,371	28·6	24·4	4·2
6c	7,769	27·3	23·9	3·4	387	29·1	27·2	1·9
8a	817	24·8	19·3	5·5	147	25·5	22·1	3·4

---

* These districts were selected entirely from the statement of the character of the districts with one exception, viz., 7b., which was relegated to the following table on account of the large poverty index for back-to-back houses.

TABLE 2.

Death-rates in Unselected Districts in the Township of Manchester in 1891–94 in all Houses and in Back-to back Houses respectively.

District	All Houses				Back-to-back Houses			
	Population	Death-rates after Distribution	Death-rates without Distribution	Difference	Population	Death-rates after Distribution	Death-rates without Distribution	Difference
1b	5,457	24·0	15·3	8·7	397	29·0	20·2	8·8
*2a	13,197	33·5	22·3	11·2	1,528	31·6	27·3	4·3
2b	549	17·8	14·1	3·7	127	15·8	11·8	4·0
*6a (Angel Meadow)	2,159	49·7	17·1	32·6	354	32·5	26·2	6·3
*6b (Angel Meadow)	7,496	40·8	22·9	17·9	2,208	38·5	28·0	10·5
7b	12,061	22·4	20·2	2·2	555	26·1	20·3	5·8
8b	25,148	24·3	22·1	2·2	120	20·8	16·7	4·1
11b	3,202	23·3	21·8	1·5	5	50·0	50·0	...

* These contain a large lodging-house element. (See column 3.)

TABLE 3.

POPULATIONS IN SELECTED DISTRICTS IN ALL HOUSES AND IN BACK-TO-BACK HOUSES AT GROUPS OF AGES IN 1891–94.

District	UNDER 1 YEAR		AGES 1 TO 5		AGES 5 TO 15		AGES 15 TO 25		AGES 25 TO 45		AGES 45 TO 65		65 AND UPWARDS	
	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back
7a	169	30	602	113	1,328	211	1,147	142	1,751	317	816	131	139	17
9a	267	56	873	172	1,975	279	1,738	233	2,380	462	1,187	203	197	13
10	442	73	1,441	227	3,259	410	2,868	307	3,919	601	1,960	232	325	44
11a	339	95	1,107	300	2,504	426	2,203	378	3,011	745	1,506	279	249	46
1a	110	17	393	74	946	141	978	76	1,441	129	729	58	125	11
3	316	51	1,127	172	2,712	286	2,803	223	4,130	407	2,090	200	356	32
6c	220	14	786	51	1,733	75	1,497	56	2,286	135	1,065	45	182	11
8a	23	7	83	19	182	28	158	18	240	54	112	15	19	6
9b	270	30	880	94	1,992	152	1,753	115	2,396	288	1,199	84	199	10

TABLE 4.

Death-rates from all Causes at Groups of Ages in Selected Districts in 1891–94.

District	Under 1 Year		Ages 1 to 5		Ages 5 to 15		Ages 15 to 25		Ages 25 to 45		Ages 45 to 65		65 and Upwards	
	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back	All Houses	Back-to-back
7a	331·1	375·0	64·3	75·2	5·6	5·9	6·5	8·8	18·1	22·1	46·6	47·7	136·7	132·3
9a	259·4	294·8	67·9	78·5	6·7	12·6	6·6	14·0	20·8	18·4	64·4	56·7	172·2	442·3
10	279·5	359·5	62·8	87·1	7·2	6·7	7·8	5·7	18·3	21·6	54·6	73·3	160·0	164·9
11a	272·9	284·1	49·2	57·5	6·4	8·2	6·1	7·3	13·8	12·4	39·5	44·8	136·6	141·3
1a	213·5	205·7	40·7	47·3	3·4	1·8	3·3	0·	7·6	7·8	24·0	38·8	90·0	0·
3	338·0	269·6	53·2	36·3	5·8	2·6	5·0	3·4	14·8	13·5	40·7	33·8	122·2	171·9
6c	236·5	285·5	38·2	44·1	6·1	13·3	6·5	4·5	16·6	9·3	44·8	33·3	131·8	90·9
8a	130·4	71·4	42·2	52·6	4·1	17·9	4·7	0·	14·6	9·3	55·8	16·7	131·4	166·7
9b	278·8	300·0	61·1	63·8	4·0	6·6	6·8	10·9	14·6	13·0	42·5	47·6	146·8	350·0

In Table 3 are given the populations in the selected districts, calculated at the middle of the period 1891–94, at groups of ages, and the same distribution of populations in back-to-back houses as obtained by the census taken this year. Many of these figures are small, in regard especially to the back-to-back houses in the district; and in order to arrive at a sufficient basis of reasoning, it is necessary to add the populations at groups of ages in these districts, and to calculate out the death-rates on the aggregate populations. Nevertheless, although the figures are small, there is an advantage in taking the districts separately, since we are thus in a position to ascertain the trend of the figures, and to see what figures tend to constancy and what to variation. Before discussing these figures, it is necessary to repeat that the total populations are probably slightly under-estimated, and that the death-rates in all houses are probably therefore somewhat overstated; not, however, to such an extent as to affect the conclusions arrived at. First, then, as regards total mortalities after distribution of the deaths from institutions, it is seen that the total death-rate in back-to-back houses exceeds in each of the selected districts the death-rate for other houses, and generally considerably. Taken along with the excess of the poverty-indices for other than back-to-back houses in all but one of the selected districts, this points strongly to a disastrous action on health exerted by the mere back-to-backness of the dwellings.

If, now, we examine Table 4, showing the distributed death-rates in all houses and in back-to-back houses at groups of ages, we perceive, first of all, that at the early ages (under 1 year and at ages 1–5) there is a general excess of death-rate in the back-to-back houses. The same preponderance is observable, though less regularly, at ages 5-15. At ages 15-25 there is still a preponderance, though less regular than at ages 5-15. At ages 25-45 there is but little difference, though the number of districts in which the death-rate exceeds in houses other than back-to-back is in a majority. At ages 45-65 again there is no great difference in the aggregate. But at more advanced ages there is a marked preponderance in the deaths occurring in back-to-back houses. Thus the results are tolerably uniform. Back-to-back houses show a heavier death-rate in early life and at advanced ages, which is not present at the middle period of life. The aggregate mortalities are considerably higher in the back-to-back houses.

When, now, we consider the particular diseases which go to make up the aggregate mortalities, and which have been previously considered in connection with this subject, we find that in the selected districts there is a preponderance in the mortality from phthisis in the back-to-back houses. This is, however, not invariable. Thus, in 9a the mortality in all houses from this cause is 3·4, in back-to-back houses 2·8. In 3, the figures are for each 2·6; in 8a they are respectively 2·1 and 0·0; in 9b, 2·5 and 2·3. There is not that marked preponderance of phthisis which we should expect from previous investigations. The complete figures are—

DEATH-RATES FROM PHTHISIS.

District	All Houses	Back-to-back
9a	3·4	2·8
10	3·0	3·8
11a	2·4	3·2
9b	2·5	2·3
1a	1·4	1·5
3	2·6	2·6
6c	3·3	3·9
7a	2·6	3·4
8a	2·1	0·0

It could scarce be inferred from these figures that the fact of a house being back-to-back gave it a special power for harm over other classes of dwelling, so far as the production of phthisis is concerned.

From lung diseases, other than phthisis, the total mortalities are—

District	Through	Back-to-back
9a	10·3	11·6
10	10·2	15·6
11a	7·8	9·2
9b	8·2	6·1
1a	4·4	6·4
3	7·2	6·0
6c	6·8	3·9
7a	8·3	9·4
8a	5·5	5·1

Taking into account the populations of the districts, there is here a decided excess of lung disease in back-to-back houses. It is, however, not present in every district.

If, now, we analyse this excess in reference to the period of life to which it belongs, we find that at ages under 1 year there is no great difference in mortality, while the districts vary considerably. There is, however, a slight preponderance of the death-rates in back-to-back houses. At ages 1–5 the excess of death-rate in back-to-back houses is marked. At ages 5–15 there is an excess, though small. At ages 15–25 the difference is slight, being in favour of back-to-back houses. At ages 25–45 there is an excess of mortality in houses other than back-to-back. At ages 45–65 there is considerable variation, but the balance is against back-to-back houses. At ages 65 and upwards there is a decided preponderance of mortality in back-to-back houses. Here, as shown in the general death-rates, it is in childhood and at advanced ages that back-to-back houses exhibit an excess of mortality. At middle ages there is an inclination, though slight, in the opposite direction.

If, now, we take the zymotic disease group, the death-rate from which is mostly in childhood, we get the following figures :—

District	SMALLPOX, SCARLET FEVER, MEASLES, WHOOPING COUGH, ENTERIC FEVER, DIARRHŒA		DIARRHŒA	
	Through	Back-to-back	Through	Back-to-back
9a	5·1	8·3	2·1	3·0
9b	4·1	5·8	1·8	3·2
10	4·2	6·4	1·6	3·4
11a	3·5	4·4	1·4	2·1
1a	3·0	3·0	1·0	0·5
3	4·0	6·0	1·9	2·7
6c	3·0	6·5	0·6	2·0
7a	5·0	7·5	1·8	3·1
8a	3·1	3·4	0·9	0·0

It will thus be seen that there is a steady and practically uninterrupted excess of mortality in back-to-back houses from zymotic disease generally, and that the diarrhœa mortality in these houses also preponderates greatly over that in other houses.

The following table exhibits for these districts the mortalities from other diseases than those already mentioned at groups of ages :—

District	All ages		0-1		1-5		5-15		15-25		25-45		45-65		65 and over	
	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.
9a	17·6	21·3	153·6	174·2	20·6	17·4	2·9	4·5	3·0	7·5	8·9	8·7	33·0	33·3	109·0	288·4
9b	15·5	22·7	173·2	208·3	17·0	21·3	1·1	4·9	3·8	6·5	6·9	9·5	22·9	29·7	100·5	250·0
10	17·1	20·5	165·8	219·2	18·0	19·8	4·0	1·8	3·5	2·4	8·2	7·5	28·6	35·6	101·5	90·9
11	14·8	18·0	165·2	184·2	16·0	16·7	3·2	6·5	2·4	3·9	6·1	5·0	23·2	21·5	85·4	92·4
1a	9·4	9·9	100·0	73·5	15·9	20·3	1·9	1·8	1·8	0·0	4·2	3·9	13·7	25·9	60·0	0·0
3	14·8	14·0	195·4	137·3	18·6	7·3	2·6	0·9	2·0	0·0	7·6	9·8	22·4	13·8	77·2	125·0
6c	14·1	14·9	143·2	160·6	14·6	14·7	2·5	13·3	2·5	0·0	9·0	1·9	22·3	16·6	78·3	68·2
7a	17·5	19·0	221·7	258·3	21·2	17·7	2·8	4·7	2·8	1·8	8·4	10·3	25·4	19·1	80·9	88·2
8a	14·1	17·0	54·4	71·4	21·1	39·5	1·4	8·9	0·0	0·0	7·4	9·3	37·9	16·7	92·1	41·7

DEATH RATES IN AGE GROUPS, 1891–94.

DISTRICTS 7A, 9A, 10, 11A, 1A, 9B, 3, 6C, 8A.

Causes of Death	ALL AGES				UNDER 1 YEAR				1–				5–			
	ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK	
	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house
All Causes	30·3	23·7	37·0	31·4	279·1	245·0	299·9	286·3	55·7	48·2	63·8	60·3	5·9	5·3	7·2	7·1
Phthisis	2·7		3·0		0·2		...		0·5		0·2		0·7		0·6	
Lung Diseases...	8·2		9·7		60·2		60·4		17·7		20·4		1·3		1·6	
Smallpox.........	0·0		...		0·1		...		0·0		...		0·0		...	
Measles	0·8		1·4		6·3		6·7		5·8		8·8		0·1		...	
Scarlet Fever ...	0·3		0·3		0·3		...		1·8		2·0		0·3		...	
Diphtheria	0·2		0·3		0·7		1·3		1·7		1·6		0·2		0·1	
Whoop : Cough.	0·9		1·1		10·4		12·1		5·3		4·7		0·2		0·2	
Enteric Fever...	0·3		0·3		0·2		...		0·2		...		0·3		0·4	
Typhus Fever...	0·0		...		...		...		...		...		...		...	
Ill-defined Fever	0·0		...		0·1		...		...		...		0·0		...	
Diarrhœa	1·6		2·6		33·5		36·2		4·8		9·0		0·1		0·1	
Total Zymotics..	4·0		6·0		51·7		56·3		19·7		26·2		1·2		0·9	
Other Diseases..	15·4		18·3		167·0		183·0		17·8		17·0		2·8		4·1	
Population	75,233		9,726		2,156		373		7,292		1,222		16,631		2,008	

DEATH RATES IN AGE GROUPS, 1891–94—*continued.*

DISTRICTS 7A, 9A, 10, 11A, 1A, 9B, 3, 6C, 8A.

Causes of Death	15–				25–				45–				65 +			
	ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK		ALL HOUSES		BACK-TO-BACK	
	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house	Rate	Rate without Work-house
All Causes ……	6·2	5·1	7·3	5·7	15·9	11·4	15·9	12·0	45·8	31·8	49·7	36·9	139·1	83·4	172·4	96·1
Phthisis ………	2·1		2·6		4·6		4·9		5·0		6·4		1·8		1·3	
Lung Diseases…	0·9		0·6		3·3		2·9		15·5		17·8		46·6		59·2	
Smallpox………	0·0		…		0·1		…		0·0		…		…		…	
Measles ………	0·0		…		…		…		…		…		…		…	
Scarlet Fever …	0·0		…		0·0		…		…		…		…		…	
Diphtheria ……	0·1		…		0·0		0·1		…		…		…		…	
Whoop: Cough.	0·0		…		…		…		…		…		…		…	
Enteric Fever…	0·4		0·8		0·2		0·4		0·2		…		…		…	
Typhus Fever…	0·0		…		…		…		0·0		…		…		…	
Ill-defined Fever	0·0		…		…		…		…		…		…		…	
Diarrhœa ……	0·0		…		0·0		0·1		0·4		0·4		2·6		1·3	
Total Zymotics.	0·5		0·8		0·4		0·6		0·6		0·4		2·6		1·3	
Other Diseases..	2·8		3·2		7·6		7·5		24·7		25·0		88·2		110·6	
Population ……	15,145		1,548		21,554		3,138		10,664		1,247		1,791		190	

It would appear from these figures that the death-rate is steadily highest from the causes other than those specified in back-to-back houses. It is decidedly so at ages 0-1, though at ages 1-5 there is a slight difference in favour of back-to-back houses. It is again highest at ages 5 to 15 in back-to-back dwellings. It is also slightly in excess at ages 15-25. At ages 25-45 it is lower in back-to-back than in other houses. At ages 45-65 there is no marked difference between the two classes of dwellings; while at ages 65 and upwards there is again a marked excess of mortality in back-to-back houses. The death-rates in this group follow the same rule as the general death-rates and the death-rates from lung disease.

To sum up, the figures obtained by the process which we have adopted give the same general results as those obtained in other ways by Dr. Tatham and Mr. Jones, viz.: that back-to-back houses, by their mode of arrangement, produce a direct injury to health, which however, so far as death-rates are concerned, is most manifest in early life and at advanced ages.

These conclusions are exhibited numerically in the tables on pages 82 and 83, which shows the death-rates, calculated on the added population of the selected districts, at groups of ages for the years 1891-94. So far as indicated by the difference of death-rates, there is rather more poverty in the other houses than in back-to-back houses.

I now come to the second part of this section, viz., a statement of the proceedings which have been adopted in reference to back-to-back houses in the City of Manchester. In Dr. Tatham's recent report on the health of Manchester for 1891–93 is given a map, showing in shading the mortalities in districts in the years 1888–90, and a very large surface indeed is covered by black, indicating a death-rate of over 40 per 1,000. The excessive mortality in these districts has long been known, and in 1885 the Unhealthy Dwellings Committee was formed to deal with the conditions which were considered to give rise to it. Dr. Tatham's investigations (published in Dr. Barry and Mr. Gordon Smith's Report in 1888) pointed very strongly to the influence of back-to-back houses in producing these high death-rates, and undoubtedly largely determined the subsequent policy in Manchester, which has been, as far as possible, to deal first with this class of property—a policy in which I decidedly concur.

Insanitary houses are dealt with in Manchester under the Local Act of 1867, section 41, which reads as follows:—

> In any case where it is certified to the Corporation by an Inspector of Nuisances, or by any two Medical Practitioners, that any building or part of a building is unfit for human habitation, the Corporation may by their order, affixed conspicuously on such building or part of the building, declare the same is not fit for human habitation, and shall not, after a date therein to be specified, be inhabited; and any person who shall, after the date or time mentioned in such order, let or occupy, or continue

> to let or occupy, or knowingly suffer to be occupied, such building or part of a building, shall be liable to a penalty not exceeding five pounds, and for a continuing offence not exceeding forty shillings for every day during which the offence may continue: Provided always, that if at any time after such order the Corporation shall be satisfied that such house has become or been rendered fit for human habitation they may revoke their said order, and the same shall thenceforward cease to operate.

It will be observed that in this Act the Sanitary Inspector takes the place of the Medical Officer of Health, a circumstance which was due to there having been no Medical Officer of Health when the Act was passed.

In the year 1887 the policy was inaugurated of pulling down some of the houses in back-to-back blocks to make yards for the remainder, which were then made into through houses, opening at the back into these yards.* It was not, however, until 1892 that these operations assumed very large proportions. In 1894 they have been considerably extended. In 1890 Dr. Tatham presented to the Sanitary Committee a report dealing with this process of conversion of back-to-back houses, which was reissued in 1893. In this report are stated very clearly the limitations under which he was prepared to approve of such alterations, as follows:—

> Without presuming to dogmatise on this difficult question, which, after all, is not exclusively a medical one, the Medical Officer of Health would ask the attention of the Committee to the following considerations:—
>
> 1. It is generally admitted that back-to-back houses are bad in principle: the chief grounds for this statement are set forth in the last paragraph on page 1 (*ante*).
>
> 2. Most of the houses of this construction in Manchester are very old; they are overcrowded on site, dilapidated, and ill-drained. Resting as they do, for the most part, on the bare ground, the floors are cold and damp. Where they do not open into backyards they abut on narrow streets, which are frequently culs-de-sac. They are of necessity unventilated, and are without decent closet accommodation.
>
> 3. Inasmuch as the reconstruction or the renovation of such houses on any really satisfactory plan will entail a heavy outlay on the owners, it becomes a serious question whether the Corporation is justified in conferring, so to speak, "a new lease of life" on property which is practically worn out, and which on this account is incapable of restoration to a condition fairly compatible with health.

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* An allowance is made by the Corporation for the houses demolished.

4. Wherever attempts have been made – in Manchester or elsewhere—to deal with worn-out or ill-constructed back-to-back property, otherwise than by demolition, the results, judged from a sanitary point of view, are not satisfactory.

5. It is a significant fact (to which attention has been directed in the report of Dr. Barry and Mr. Gordon Smith) that in the manufacturing districts of Lancashire, in the Potteries, and in the Black Country, where dwellings of the back-to-back class had formerly prevailed to a very considerable extent, the system of building houses unprovided with means for through ventilation has been almost entirely discontinued. In the Yorkshire borough of Todmorden, where back-to-back house construction was at one time the rule, the erection of further buildings of this type is prohibited by local bye-law.

Although the Corporation will probably hesitate to peremptorily require the demolition of all the back-to-back property in the City at an early date, it nevertheless appears to the Medical Officer of Health desirable that the further use of such buildings for human habitation should be restricted to those cases in which they can be brought into conformity with suitable conditions. On this point, unfortunately, no experience from other towns is available for our guidance; but it would seem expedient that the Corporation should lay down at least two fundamental requirements, in default of which the future occupation of such dwellings should be prohibited. These requirements should be—

(*a*) That the principal materials of which the houses are constructed should be sound, and be capable of thorough repair, according to one or other of the plans appended to this report.

(*b*) That in every case the streets on both sides of the rows of cottages should be through streets, without obstruction at either end; and that they should measure eight yards in width at the least.

Concurrently with the alteration of houses limited in the above manner, several areas were condemned entirely under the Housing of the Working Classes Acts in the years 1889–91, and on two of these blocks artizans' dwellings have been erected in the style so well known in London. One of these blocks is intended to house 1,250 persons, the other to house 450 persons. This is indeed the only proceeding possible, where it is desired to erect dwellings to take a population equal to that which has been displaced in crowded districts, if at the same time we are to secure a sufficient supply of fresh air and light.

STATEMENT OF BACK-TO-BACK HOUSES IN THE CITY, PREPARED IN ACCORDANCE WITH THE RESOLUTION OF THE UNHEALTHY DWELLINGS SUB-COMMITTEE OF THE 18TH NOVEMBER, 1890.

Total Number of Back-to-back Houses	Number of 2-storey Back-to-back houses opening into Streets, Courts, or Passages of the following widths														Number of 3-storey Back-to-back houses opening into Streets, Courts, or Passages of the following widths														Number of 2-storey houses opening on to open spaces, &c.	Number of 3-storey houses opening on to open spaces, &c.	Number of houses where high buildings are near, and interfere with light and ventilation	Number of houses at present unoccupied	Total amount of rental per week	Average rental per week	Total number of occupants	Average number of occupants in each house
	From 1 to 2 yards	From 2 to 3 yards	From 3 to 4 yards	From 4 to 5 yards	From 5 to 6 yards	From 6 to 7 yards	From 7 to 8 yards	From 8 to 9 yards	From 9 to 10 yards	From 10 to 11 yards	From 11 to 12 yards	From 12 to 13 yards	From 13 to 14 yards	From 14 to 30 yards	From 1 to 2 yards	From 2 to 3 yards	From 3 to 4 yards	From 4 to 5 yards	From 5 to 6 yards	From 6 to 7 yards	From 7 to 8 yards	From 8 to 9 yards	From 9 to 10 yards	From 10 to 11 yards	From 11 to 12 yards	From 12 to 13 yards	From 13 to 14 yards	From 14 to 30 yards								
9240	105	428	634	981	1,351	964	954	418	618	251	554	132	132	360	14	80	128	147	176	135	64	46	89	29	99	11	23	88	174	55	370	513	£ s. d. 1,470 3 8½	s. d. 3 2	31,008	3½
		One of this number is 1 Storey High only		One of this number is 1 Storey High only			Five of this number are 1 Storey High only		Eleven of this number are 1 Storey High only									Ten of this number are 4 Storeys High					Four of this number are 4 Storeys High			Four of this number are 4 Storeys High			Three of this number are 1 Storey High only	Fourteen of this number are 4 Storeys High						

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It has been objected to these dwellings that the children are necessarily thrown together much more intimately than where the houses are quite separate opening on a street, and that infectious disease spreads more certainly in them merely from the aggregation of infection. Possibly it may be so to some extent, but not, I think, to such an extent as to form a serious argument against them. I do not, in fact, know of any drawback attaching to these dwellings which does not also attach to cottages; and, if soundly constructed, well ventilated, and properly drained, they are an enormous advance. I consider such a building as has been erected off Oldham Road, in Manchester, with its large internal square, as a noble addition to the housing of the people.

To return to the methods of dealing with back-to-back houses, I have said that I concurred in the policy which had been pursued, viz., absolutely to condemn these back-to-back houses which do not fulfil the conditions laid down by Dr. Tatham, and in the remainder to insist on the making of yards for the houses with proper provision of conveniences. The magnitude of this task may be inferred from the following statement of back-to-back houses, presented by Mr. Rook, the Superintendent of the Sanitary Department, in 1891. From this it will be at once seen in what a large proportion of these houses the living rooms must be plunged in darkness, and how large a number are situated in narrow streets and confined courts. (See statement attached.)

Attached to the report of Dr. Tatham in 1893 are plans, according to which alterations might be carried out in back-to-back houses.

Pursuing their aim to bring light and the free circulation of unpolluted air into the altered dwellings, the Corporation have however been able in some instances to secure further improvements, one of which, off Gould Street, may be particularly mentioned. In carrying out these alterations it is intended in future to provide windows on the sides of the houses abutting on yards.

We are now in a position to consider what the Corporation have done in regard to these dwellings.

The following statement shows the total operations carried out by the Unhealthy Dwellings Committee since it was constituted in 1885 :—

Statement showing the number of Houses (mostly Back-to-back) certified as unfit for human habitation, and dealt with by the Unhealthy Dwellings Sub-Committee from February, 1885, to March 1st, 1895.

Total number of houses certified to, and dealt with by, the Committee	4,485
Total number of houses actually added and made into double through houses with yards	817
Total number of houses actually demolished (exclusive of those in various areas)	440
Total number of houses actually repaired, and nearly all made into single through houses, with yards	503
Total number of houses permanently closed	1,495
Actually treated	3,255

Leaving 1,230, which are accounted for below :—

Scheduled and dealt with in areas	225
Referred to and dealt with by other Committees	19
Awaiting expiration of notices to close	747
Stand adjourned	237
Orders of Committee not yet carried out	2
	1,230

The following return, prepared by the Superintendent of the Sanitary Department for Mr. Alderman Walton Smith (Chairman of the Sanitary Committee), of the alterations carried out in the worst districts of Manchester, shows clearly the rate at which these changes are going on :—

Summary of Houses dealt with in the Worst Districts of Manchester from January, 1889, to March 1st, 1895.

Year	Number dealt with	Number added, made into double through houses, and provided with yards	Number demolished	Number repaired, and nearly all made into single through houses with yards
Jany. to Decr., 1889	152	9	13	12
Do. 1890	47	11	11	7
Do. 1891	109	31	13	17
Do. 1892	403	82	44	92
Do. 1893	373	69	52	104
Do. 1894	956	59	31	12
Totals	2,040	261	164	244
Jany. to March, 1895	260			
	2,300			

In addition to these, 118 houses have been demolished in the Oldham Road Area (on block 2) and workmen's dwellings built on the site, and 114 houses (on block 1) are now closed and mostly demolished. This block will be dealt with in a similar manner in due course.

105 houses have been demolished on the Pollard Street Area, and workmen's dwellings built on the site.

The Lord Street Area consisted of 26 houses, and all these have been demolished.

On the Area bounded by Love Lane and Little Hulme Street, the whole of the houses (46) have been demolished.

On the Pott Street Area, 89 houses have been purchased by the Corporation.

133 houses have been demolished on the Chester Street and Wilmott Street Area.

It will be seen from these figures that a considerable number of people must have been entirely displaced by recent operations; not, it is true, so many as at first sight appears, since at least two-thirds of the houses remain in those blocks in which alterations have been carried out. What becomes of these people? No systematic inquiry has been made into the subsequent history of those who have had to leave the houses pulled down, but it has been ascertained that a portion of them do altogether leave the district, and go out into districts where building operations are going on. The greater number, however, remain in parts not far removed from their old home, and there is thus, for a time, a tendency created to overcrowding in lodgings. This tendency, it is believed, is only temporary. A gradual pressure outwards is created. A wave, as it were, of outward movement permeates the community. It must be admitted, however, that the tendency to overcrowding requires to be very carefully watched over. This tendency, from the census which was taken in 1890 of back-to-back houses, and again in this year, does not seem to have materially affected back-to-back houses, and indeed the average number of persons living in these dwellings is lower than we should expect, though many of them contain large families.

I have made inquiries as to any tendency which may have arisen in recent years to an increase in the number of new dwellings. No increase, however, has occurred within the last three years, although there is reason to believe that on one side of the City—just outside the boundary—there has been an increase of building operations. Such, however, is the legitimate and even necessary outcome of these and other changes in the centre of Manchester, and we must be prepared to consider at no distant time, concurrently with a thinning of houses in the centre, the necessity of increased facilities for transit to and from the outer ring. In the meantime, the present operations are calculated to effect a revolution in the habits and in the health of a considerable section of the poorest inhabitants of Manchester.

INFORMATION RESPECTING BACK-TO-BACK HOUSES SUPPLIED TO THE MEDICAL OFFICER OF HEALTH BY THE SANITARY INSPECTORS.

District	NUMBER OF HOUSES			How are the Houses grouped: all together, or in isolated clumps?	How are they generally in respect of light, say from overshadowing factories, &c.?	How do the width of the Streets stand relative to the height of the Houses?	How are they in respect of Defective Closets?
	Middle of 1891	Middle of 1892	Middle of 1893				
1	454	442	400	In isolated clumps about six groups: three large groups, and three smaller ones.	The greater number of these houses are ill-lighted and are overshadowed, from the narrowness of the streets or from the heights of the buildings opposite, or from both causes combined.	The mean average width of the streets is 20·91 feet, roughly 21 feet. The extremes are 9 feet wide and 45 feet; the average height of the houses is about 23 feet. By far the majority of the streets are too narrow to admit of the living rooms being properly lighted.	The closets for these houses are pail closets. In some cases a 4½-inch brick wall separates the closet from the living room. The majority of the closets are in such a condition as to lead to great pollution of the air and subsoil. The number of houses to a closet averages about three. In many cases the closets are built into the main building, with sleeping rooms over and living rooms adjoining. This district is sub-divided into 1a, a poorish quarter, in which there is no marked distinction between those inhabiting back-to-back and other houses; and 1b a part of Manchester where there are many large places of business, with caretakers, and in which considerable social differences exist.
2	647	573	534	In isolated blocks, averaging from 5 to 15 houses.	The greater portion of these houses are badly lighted owing to being overshadowed by the higher buildings, or from the narrowness of the streets, courts, and passages in which they are situated.	The streets are very narrow—on an average, about five to six yards wide — the houses two or three storeys, and the streets are too narrow to admit light into the living rooms.	They are pail closets, and the majority are in a defective condition through absence of urine guides, broken floors, and sunken or leaky and overflowing pails, causing the earth under the broken flags to be saturated with urine. There are about 215 closets to the back-to-back houses: adjoining houses, 73; a little away from house, 95; close to front doors, 36; under bedrooms, 11. When the floors of the closets are broken, the urine saturates the ground against the walls of the living rooms. This district is divided into two parts—2a, a poorer class district, containing many tailors, boatmen, shoemakers, and hand labourers; there is considerable immorality in this district, and a number of lodging-houses. 2b, a better-class district, containing very few back-to-back houses.

INFORMATION RESPECTING BACK-TO-BACK HOUSES SUPPLIED TO THE MEDICAL OFFICER OF HEALTH BY THE SANITARY INSPECTORS—*continued.*

District	NUMBER OF HOUSES			How are the Houses grouped: all together, or in isolated clumps?	How are they generally in respect of light, say from overshadowing factories, &c.?	How do the width of the Streets stand relative to the height of the Houses?	How are they in respect of Defective Closets?
	Middle of 1891	Middle of 1892	Middle of 1893				
3	665	597	446	In isolated blocks generally.	The majority of these houses are overshadowed by higher buildings, which take away the light.	Average width of streets 21 feet, average height of houses 23 feet.	Closets, generally speaking, insufficient and in bad repair as regards being without urine-guides, and the floors being broken and sunk. The whole of these are pail closets, which average one to three houses. The majority of these closets are situated under bedrooms, adjoining living rooms, and are separated from the same by 4½-inch walls in nearly all cases. There are about 20 common lodging-houses in the district. The inhabitants do not differ much socially.
6	1093	1051	994	Isolated clumps.	The houses generally are badly lighted, with the exception of those situated in streets over 20 feet wide; about 16 per cent. are opposite high buildings from three to six storeys in height.	The streets are generally narrow, and range from three to 12 yards in width respectively. The houses are generally two storeys in height, and 24 per cent. are three storeys.	The closets generally are in an insanitary and defective condition, owing to their being erected in detached blocks, open to the streets and courts, adjoining the living and underneath the bedrooms (badly ventilated) of the houses, and through the overflowing of the pails. The floors are sunk, and saturated with offensive matter. This district is divided into 3 parts: 6a, containing a number of common lodging-houses; 6b, adjoining district, containing few common lodging-houses, but many houses sublet in lodgings; 6c, a district in which the inhabitants are socially higher, on the whole, and in which there is some, though not a great, difference between those inhabiting back-to-back and through houses.

INFORMATION RESPECTING BACK-TO-BACK HOUSES SUPPLIED TO THE MEDICAL OFFICER OF HEALTH BY THE SANITARY INSPECTORS—*continued.*

District	NUMBER OF HOUSES			How are the Houses grouped: all together, or in isolated clumps?	How are they generally in respect of light, say from overshadowing factories, &c.?	How do the width of the Streets stand relative to the height of the Houses?	How are they in respect of Defective Closets?
	Middle of 1891	Middle of 1892	Middle of 1893				
7	471	471	452	In isolated clumps.	The houses generally are not overshadowed by factories or other buildings.	The width of the streets compares very favourably with the height of the houses with a few exceptions.	The closets are used in common by three or more families, and in some cases are situated under the sleeping rooms, also adjoining the living rooms, or are in close proximity to the houses. The floors are saturated with urine and other offensive liquid matter, which causes them to be in a wet and soddened condition. This district is divided into two portions—7a, in which there are a large number of back-to-back houses, while the social conditions do not differ materially; 7b, in which again the back-to-back houses, which are in the outer part of the district, are occupied by people of the same status as the other houses: the social conditions are altogether better in this district.
8	97	97	87	The back-to-back houses are situated in isolated clumps.	The houses are fairly well lighted, not being overshadowed by factories or high buildings.	Streets fairly wide.	The privies are generally bad, being used in common. They are situated in blocks under bedrooms, and adjoin living rooms. The floors are sunken, and, from the fact of the privy pans overflowing, the earth underneath is wet, foul, and sodden. This district is divided into a very small portion (8a), of which the inhabitants are mainly hawkers. The same class of people inhabit the through and back-to-back houses. (8b) A better-class district, containing very few back-to-back houses.

INFORMATION RESPECTING BACK-TO-BACK HOUSES SUPPLIED TO THE MEDICAL OFFICER OF HEALTH BY THE SANITARY INSPECTORS—*continued.*

District	NUMBER OF HOUSES			How are the Houses grouped: all together, or in isolated clumps?	How are they generally in respect of light, say from overshadowing factories, &c.?	How do the width of the Streets stand relative to the height of the Houses?	How are they in respect of Defective Closets?
	Middle of 1891	Middle of 1892	Middle of 1893				
9	780	762	723	Generally in isolated clumps.	The majority are fairly well lighted, but there are a few that are overshadowed by very high buildings.	The width of the streets fair, with a few exceptions.	Generally bad, owing to saturated state of the ground with offensive matter. The closets are mostly built in the centre of the blocks, adjoining the living rooms and under the bedrooms, and in some cases they are built inside the living rooms and divided by four-inch walls only. This district is divided into two portions (9a and 9b), in neither of which is there much social disparity. 9b are on the whole of a better class than 9a, and are, if anything, more nearly alike socially.
10	657	638	601	The houses are in isolated clumps in blocks of 20 to 30.	The houses, with a few exceptions, are not overshadowed by factories or workshops, but being situated in narrow streets are badly lighted.	Streets narrow.	In three cases the closets are situated in the living rooms, a large majority are under the bedrooms, and others are in similar objectionable places. They are generally in a very insanitary condition through leaking pails, saturated ash-place floors, and other offensive accumulations. In this district there is little social disparity. There are here many hawkers, market-porters, and people working in waste warehouses. There are only three common lodging-houses in the district, and about 70 houses sublet in lodgings.

INFORMATION RESPECTING BACK-TO-BACK HOUSES SUPPLIED TO THE MEDICAL OFFICER OF HEALTH BY THE SANITARY INSPECTORS—*continued.*

District	NUMBER OF HOUSES			How are the Houses grouped: all together, or in isolated clumps?	How are they generally in respect of light, say from overshadowing factories, &c.	How do the width of the Streets stand relative to the height of the Houses?	How are they in respect of Defective Closets?
	Middle of 1891	Middle of 1892	Middle of 1893				
11	772	712	659	Isolated clumps.	Generally the houses are not overshadowed.	With a few exceptions, the width of the streets compares favourably with the height of the houses.	The closets are generally situated between the houses, with bedrooms over them. Generally they are in a defective and dirty condition. This district is subdivided into 11a, a poorer district, in which, however, the social disparity is small; and 11b, a portion inhabited by the better class of artisans, and containing no back-to-back houses.

ON SANITATION IN HOUSES OTHER THAN BACK-TO-BACK HOUSES.

It having thus been made clear that back-to-back houses are more inimical to health than through houses, our next inquiry must be how it comes about that so high a death-rate prevails in the centre of the City amongst those who do not inhabit back-to-back houses, and who do not belong to the class frequenting common lodging-houses. The question, What are the conditions acting inimically to health? is rather a wide one. It is certain that the personal habits of the population exercise a powerful effect upon the death-rate, and it would be, not perhaps impossible, but certainly extremely difficult to institute such inquiries as would enable us to judge how much effect was produced, respectively, by personal habits, and how much by the dwellings and other injurious conditions of housing. Nevertheless, there are certain fundamental principles which it is quite safe to abide by in considering the influences acting unfavourably on the public health, and one of these is that dirt is one of the chief causes of disease. Now, especially in the central parts of the City, the aggregation of dirt in its most injurious forms is a very prominent fact. Wherever one goes in the older parts of Manchester, one finds rows of through houses with very small yards at the back, which are separated from each other by very narrow passages. In summer almost constantly, in winter frequently, a heavy and depressing odour hangs about these passages, and the atmosphere inhaled by the people who live much in the rooms at the back of the houses is unquestionably deleterious. The cause of this condition of things is not far to seek. Lining the passage on both sides is a row of openings by which the pails containing the excreta belonging to the houses are removed. When the ground on which the pail stands is examined it is frequently found to be in a wet state, and to give off offensive odours. If, now, we examine the pail from above, it is generally seen that the top of it stands at so great a distance from the seat that, were no further provision made, the urine would be bound to flow down past the pail on the ground. Such provision is, however, supposed to be made, by means of strips of metal called urine-guides, which are fastened round the border of the wood, and are intended to guide the urine into the pail. As a matter of fact, unless these receive an extraordinary amount of attention they are frequently absent or useless. They are said to be knocked off in the act of removing the pails, and they are certainly quickly corroded by the action of the urine. The result is that in many places the ground has sunk from the soakage of urine so as to form a veritable cesspool. It has been found impossible to deal with this matter in the usual way. The defects are so numerous that a few prosecutions effect nothing. This dangerous condition of things led me to recommend to the Nuisance Sub-Committee, in 1894, that further steps should be taken to prevent the soakage of the ground going on. A conference was held between representatives of the Cleansing and Sanitary

Committees on July 11th, at which it was agreed that the Corporation should themselves fix on the urine-guides in the district of Angel Meadow. This experiment was so successful that on January 18th, 1895, I made a representation to the Chairman of the Nuisance Committee; and again on February 27th, 1895, a similar representation was made to the Chairman of the Nuisance Sub-Committee to the following effect:—

Public Health Office,
Town Hall, Manchester,
February 27th, 1895.

The care of Pail Closets.

To the Chairman of the Nuisance Sub-Committee.

On January 18th of this year the Medical Officer of Health addressed a letter to the Chairman of the Nuisance Sub-Committee, recommending that the Corporation should replace defective or absent urine-guides throughout the City. The urine-guide is a strip of metal fastened round the seats of privies for the purpose of guiding the flow of urine into the pails beneath. When this guide is absent or corroded, such is the depth of the pails beneath the seat that the urine is usually carried into the ground round the pail, and not into the pail. Mainly from this cause the backyards are offensive in many parts of Manchester, winter and summer alike.

Since July of 1894 the Cleansing Committee have been carrying out the experiment in Angel Meadow of themselves fixing these guides, whenever found defective, with the greatest success and benefit to the district.

Accordingly, the Nuisance Sub-Committee referred the letter mentioned to the Cleansing Committee, recommending the proposal for adoption. The Cleansing Committee, however, do not see their way to do this work. They consider that the removal of nuisances rests properly with the Sanitary Committee.

I would again press this matter urgently on the consideration both of the Sanitary and of the Cleansing Committees. It is estimated by Mr. Callison that some 10,000 of these urine-guides are absent throughout the City. The result is that the soil and even the walls of the poorer houses are soaked with urine, and that disease is certainly manufactured by these conditions. The immediate expense of putting all these urine-guides on, at 10d. each, would be £416 13s. 4d.

Two policies are possible for the Corporation: to compel the owners to do this work, or to do it themselves. The plan of compelling the owners to do the work has been tried, and has not been successful. Time is lost by the Sanitary Inspectors in inquiring into such nuisances, and in serving notices. Landlords are simply irritated by the receipt of these notices, and pay no attention to them. The evil is so general that it is no disgrace to be summoned for neglect in this matter. Prosecutions effect little or nothing. In fact, the evil remains practically untouched by the usual methods.

The work of the Cleansing Department is, I am informed, greatly increased by the dirty condition of the ground round these pails; and, above all, the nuisance continues.

There is thus really no feasible way out of the difficulty except for the Corporation to do this work themselves. The employés of the Cleansing Department, with the assistance of the Sanitary Department, would at once report defective closets, and the Corporation would at once do the work at their own expense.

It falls, in my opinion, on the Corporation to do the work, for these reasons:—

1. With a properly regulated pail system, urine-guides should not be necessary

2. It is said that they are largely knocked off by the employees of the Cleansing Department.

3. A gross nuisance and danger to public health will, in the meantime, be removed in that way, which cannot otherwise be immediately dealt with.

4. It is a question whether the outlay would not be recouped in time, trouble, and labour now fruitlessly expended on these closets.

MEDICAL OFFICER OF HEALTH.

The Sanitary Committee were of opinion that the Corporation should undertake this work, and a sum of £400 has been included in the year's estimate for the purpose. Over 1,000 of these urine-guides have been already fixed, and the work is proceeding rapidly. Money could not well be better spent. But it follows in the nature of things that, however necessary it may be to remove as fast as possible the cause of so gross a nuisance, the remedy applied is incomplete, and much more radical measures are called for.

Suppose the urine guides all satisfactorily fixed, and, being fixed, to have the result of preventing soakage of the ground by urine, a very great danger to health would be removed. The pollution of the atmosphere, however. in these contracted yards and passages would remain, although much diminished. What would be gained would be the removal of the saturated condition of the ground, at all events in part. But it is unfortunately the case that the structural arrangements of the closets, as well as the conditions which these have brought about, forbid that anything more than a mere improvement should result from fixing these urine-guides. No doubt a good pail system is a vast improvement on the old midden privy, but it cannot be said that the pail system in Manchester answers well. The actual conditions, indeed, are such as to render the ground a nursery for the infections of such diseases as summer diarrhœa and typhoid fever. The houses are built direct into the ground, cellars being exceptional, without the interposition of any damp-proof course. The consequence is that any pollution of the soil such as has been described will necessarily cause polluted water to be sucked into the brickwork of the walls. In fact, whether as regards pollution of the atmosphere or as regards the generation of disease in the ground, the presence of these defective pail arrangements in confined yards must be regarded as a serious injury to health.

Then, again, as regards the passage drains, which remove waste matters from the backs of the houses—they are, for the most part, in a defective condition. I am informed that the majority of the drains put in previous to the last five years are brick drains, or drains constructed partly of brick and partly of butt-jointed pipes, or they are entirely made up of such butt-jointed pipes. Before 1875 the drainage was almost entirely composed of such pipes. I am informed that when these drains are taken up it is often found that liquid impurities have percolated to a distance from the pipes, and in many instances have passed under yard walls. Such a condition of the drains—leading, as it often does, to blockage of the pipes, and to the collection of stagnant water in the passages—will necessarily still further pollute both the ground adjoining the houses and the atmosphere surrounding them.

Now it is difficult to say whether such a condition of the drainage is worse now than it would be if water-closets were put in the yards, but it is quite certain that water-closets should not be put into the backyards of houses without securing for their contents a free and uninterrupted passage to the sewer. It is equally clear, however, that a radical alteration is needed in the system of excreta removal, and in the condition of the drainage in the back passages. It might conceivably be advanced that the pail system is a good one, if it is properly contrived and adequately administered. That is, under favourable conditions, a tenable position. It is not, however, in my opinion, a position which can be maintained where these small yards and narrow passages are concerned. The question of reconstruction of the drainage, again, is an independent one. It does not depend on whether water-closets should be substituted for pails. With the arrangement of houses which has been described, the drainage should be made good on account of the evils at present attending its defective condition. The object to be aimed at is to get the atmosphere and ground at the back of the houses clean, especially in the parts of the City where such confined conditions prevail. The present arrangements are certainly responsible, in part, for the high death-rate in the central parts of Manchester, and suitable alterations would undoubtedly lower the mortality.

The anticipation of a marked improvement in the health of Central Manchester, if the present defective pail system is replaced by a suitable water-carriage system, does not rest entirely on theory, although in the present instance such theory amounts to certainty. In other towns the adoption of water-carriage has been followed by a marked improvement in the health of the inhabitants. Such has been the case in Birmingham, Leicester, and Southport. In a recent paper on the subject, the Medical Officer of Health for Leicester, by comparison of the death-rates in the parts of Leicester which have been water-closeted with the rates in those portions which have remained under older methods, gives reasons for believing that a decided saving of health has resulted from water-carriage. As we have seen in considering the death-rates attaching to back-to-back houses, provided the comparison is between the inhabitants of the same districts, this method has a peculiar value. Similar improvements have followed in other towns, such as Burnley and Accrington, on the adoption of water-carriage; and there is a general consensus of opinion that, spite of some difficulties, the water-carriage system is the best. Were it otherwise, there would still remain the pressing need of an entire change in the methods of refuse removal in the older parts of Manchester.

There are, of course, other defects from a sanitary point of view attaching to the houses in the older parts of the City, but these are so outweighed by the closet and drainage defects that I have thought it better in the first instance to call attention only to these, so that their importance may not be lessened by placing them side by side with lesser evils.

ON FOOD SUPPLIES.

Supposing food is not easily digested, or is bad in quality, it frequently sets up a process of fermentation, the products of which are absorbed, and act injuriously on the system. The digestive processes depend on the vigour of the nervous system, which in turn is dependent on the supply of proper aliment and on the due removal of effete matters. For complete health it is thus necessary that there should be sufficiency of fresh air, of activity, of rest, and of proper food. By proper food is meant food which has been well selected so as to fulfil the requirements of the body in an economical manner, and which has been so cooked that the alimentary tract can dispose of it easily. The necessity of attention to a strict dietary depends greatly on the individual and on his surroundings.

A certain standard of diet has been found most economical and useful, but the manner in which this standard is to be applied needs a certain latitude, since experience shows that different constitutions react very differently to the same articles of food.

It should, however, become a matter of universal knowledge what general balance of elements ought to be maintained between the constituents of the daily meal, since in this way not only may considerable economy be effected in our food supplies, but a strain on the resources of the system which, little felt in early life, gradually becomes more severe with advancing years, may be avoided. What is most necessary for this purpose is that a part of the instruction in our schools should be the dietaries suitable for adults and for children, in their equivalents of starches, carbohydrates, albumens, and salts. Taking the articles of food easily accessible, dietaries should be constructed from them so as to fulfil the requirements of a normal dietary with due attention to economy and variety—and it would be an excellent exercise for advanced pupils to practise the construction of such dietaries.

Then, again, the nutriment derived from food depends greatly on the manner in which it is cooked, since the flow of alimentary juices depends largely on the palatableness of food. It is also the part of good cooking to effect that combination between the water employed in cooking and the particles of food cooked which will most readily expose the whole of the food to the digestive juices.

Much may be done to restore vigour to weak people and invalids by well-cooked food. For the same class of people all food of which they partake should be scrupulously clean, both because food is far more palatable when so presented, and because to such people the presence of dirt in their food is specially dangerous. It is therefore matter for much congratulation that lessons in cooking now form part of the course in Board Schools, and that good Schools of Cookery have been established in Manchester. A great deal is to be hoped for in connection with this movement in the way of preventing disease, especially if it were found possible to combine, with instruction in cooking, lessons in the selection of the articles to be cooked and in storage, so as to avoid using contaminated food. If such articles of food as meat, fish, vegetables, and especially soups of all kinds, are kept for any length of time in an unsuitable place they are liable to be overgrown with fungi which produce disease, and instruction in the keeping of food stuffs is therefore of great importance. Much also depends on the action of the Sanitary Authority in regard to unsuitable foods.

Into a city like Manchester, food is being brought from all quarters, and disease is certainly being constantly introduced in that way. The meat used in the City, for example, is partly from animals killed at the Water Street and Rusholme abattoirs, partly from animals killed in private slaughter-houses in and near the City, partly from imported carcases and from animals killed in Birkenhead, and partly, it may be, from inferior meat killed on the farms.

So far as the animals killed at the abattoir is concerned, the greatest confidence may be felt in the meat, but the same confidence cannot be given to meat killed in the private slaughter-houses. With regard to the 106 private slaughter-houses in the City, it may at least be said that they offer a temptation to the introduction of diseased and inferior meat, and that a sufficient inspection of them is extremely difficult, if not impossible. It may be said generally that no meat which has not undergone thorough inspection should be allowed to find its way into the shops, but it may be assumed with absolute confidence that bad meat does find its way into the shops under existing conditions, and hence the butchers' shops and the stalls in the market ought to undergo a most thorough inspection.

In the City of Berlin all the meat used is inspected at a central abattoir, and a large staff of female microscopists are employed to examine any suspicious meat. Without going so far as to recommend such a proceeding, I would point out that more precautions should be taken to prevent the introduction and sale of diseased meat, especially of meat from tuberculous animals.

Perhaps as great a danger to health as tuberculous meat is the slink which one sees sold in the poorer districts at very low prices, and which is not calculated to supply a sufficient amount of nutriment; and meat which has become tainted, either owing to its originally bad condition or to the manner in which it has been kept. Perhaps even a greater danger is to be looked for from fish which has been kept too long, and which I am assured is hawked in some parts of the City at very low prices. Such food is calculated to cause severe attacks of illness and diarrhœa, even if its consumption is not attended with worse consequences. Able and energetic as your Veterinary Surgeon undoubtedly is, he is not, I think, in a position to control this traffic effectually without assistance.

Recent experiences, showing the danger of the conveyance of typhoid fever by means of oysters, have emphasised how necessary it is that shell fish should be obtained from reliable sources.

There are many ways in which food may be dangerous to health, to one of which I would call special attention. Anyone who takes a walk through the poorer quarters of the City will not fail to have been struck by the dark and dirty condition of many of the small shops containing provisions for sale, such as milk, bread, potted meat, boiled ham, butter, cheese, fruit, &c. These shops are generally directly connected with a living room, which is often occupied by a large family. Often they contain potatoes and other vegetables in baskets on the floor. Under these circumstances, the articles of food first mentioned will often serve as soils for the growth of injurious fungi. There can be no reasonable doubt that much mischief is caused in this manner. Special attention should be directed to these shops, so as to secure their being kept in a cleanly condition.

There is one article of food which calls for more comprehensive and particular treatment, both on account of its absolute necessity to children and many invalids, and from the dangers which have been found to attend on its use. While it is an ideal food, it forms, at the same time, an excellent medium for the growth of many parasitic fungi, which cause disease in man. Many outbreaks of typhoid and scarlet fever have been traced to the consumption of milk which has become contaminated with infectious matter peculiar to those diseases. Since there is practically no doubt that the germs of these diseases multiply in milk outside the body, the fresh developments of our milk supplies have served to increase the danger. Outbreaks of diphtheria have also been traced to the use of particular milk supplies. There can be no doubt that consumption, especially in children, often results from the use of milk derived from tuberculous cows, which form a large proportion of all the animals in our cowsheds. It is probable, also, that many other diseased conditions besides those mentioned are due to the use of unprotected milk, although it is only occasionally that such effects become so striking as to be unmistakable. Of one such occurrence I presented a report to the Hospitals Sub-Committee in the end of 1894, which is here reproduced :—

"An Occurrence of Milk Infection.

"On November 7th, Dr. Henry Ashby sent me a note in reference to a number of cases of illness which had occurred in Victoria Park, Manchester, some of them having come under his professional observation. The symptoms he described as being diarrhœa, sickness, and abdominal pain. Those attacked were all supplied by one milk dealer, and he was of opinion that circumstances pointed to the milk as being the cause of the attacks. On that day and the following I called at a few houses in the Park, the addresses of which I had received from Dr. Ashby, and inquired into the circumstances under which their illnesses had taken place. All the families affected had received their milk from one dealer, and, so far as I was able subsequently to ascertain, all the families attacked in a similar manner at that time received the same supply, and other individuals not so supplied were found to have partaken of that milk. The chief points which I ascertained in the preliminary inquiry were that the attacks in the great majority of instances occurred on the night of November 5th and in the early part of November 6th. As a rule, the persons attacked had partaken of unboiled milk. The milk supplied on the morning of November 5th first produced the symptoms. It did not seem to make much difference in the result whether a small amount of milk in tea or coffee, or a large amount, was used. One lady was positive that all milk brought into the house was boiled, and in a number of instances the milk had been warmed.

"One occurrence of illness after the use of boiled milk is, however, scarce sufficient to found a conclusion upon, as an oversight might have been made.

"At the first house I went to I was told that the children attacked always had their milk boiled, except on that particular morning.

"In the second house four escaped. One had had boiled milk, two others never used it, and the fourth only took a little in tea. The three attacked had had unboiled milk.

"In a third house ten were attacked and three escaped. Two of these did not have milk at all. Those attacked all took milk freely.

"At a fourth house, a girl who came to clean the steps received a glass of milk, and was subsequently ill with the same symptoms as those attacked in the household.

"At another house, not in the Park, five members of the family were taken ill: one on the night of the 4th, one on the night of the 5th, and three others on the 7th. This household was the only one in the street supplied by the milk dealer whose milk was concerned.

"A considerable time elapsed, at least eight or nine hours, between taking the incriminated milk and the occurrence of symptoms of illness.

"The conclusion drawn from these preliminary visits was that the phenomenon was probably one of bacterial growth in the body—*i.e.*, of infection—from the use of this particular milk supply.

"On November 8th I obtained a sample of Monday evening's milk from a patient of Dr. Ashby's and took it to Professor Delépine, who very kindly undertook to make plate cultivations from the milk, and otherwise to examine it bacteriologically. This milk had an unpleasant odour. Another sample of Wednesday's milk, which I obtained on a visit to Victoria Park on November 8th, also had a disagreeable odour, which I seemed to recognise at the time, but could not locate. On subsequently learning what had happened at the farm, I seemed to recollect the odour as resembling that of 'sweet pus.'

"On November 8th I also saw Dr. Waddell, of Rusholme, who had visited a large number of cases. On the previous day he called at the farm-house from which the incriminated milk came, but beyond general insanitary conditions he ascertained nothing, and he was assured that there was nothing the matter with any of the cows. He informed me that the farmer had two supplies, one from his farm and another from Derbyshire, and that those attacked in Victoria Park had received their milk only from the farm, this special supply being retained for their use. Those who were supplied with the Derbyshire milk had escaped.

"On November 9th I called at the farm, along with Mr. King, the Veterinary Surgeon of the Corporation. Mr. King made a careful examination of the cows, and found nothing in their condition which suggested that any of them could have produced milk so toxic as that sent out from this farm.

"I asked the farmer a good many questions, interrogating him closely about the health of the cows, and the health of the milkers, as well as of those who had to do with the milk otherwise. He informed us that a milkman had recently left him. We discovered nothing in reference to either man or cow, the farmer denying that either his employees or any of his cows had been ill. I also inspected the farm premises along with Dr. Martin, Medical Officer of Health for Gorton (in whose district the farm is), and his Inspector. Close to the farm-house is a tip of midden-privy refuse belonging to the Gorton Local Board, which Dr. Martin informed us might contain 40,000 tons of material of that kind. The farm is bordered on two sides by streams which meet below, one coming from this tip, and very foul, the other comparatively clear, but also contaminated with sewage and with matter from a tripe-boiling place. The water used to wash the pails was tepid. Dr. Martin took the temperature of this water, which was 92° Fahrenheit. As was subsequently ascertained by Inspector Lord, the water used in cleansing the milk pails was kept in a foul cistern. The cows also drank from a pool in the yard which received drainage from the cowshed midden. The storage of milk over-night was such as to expose it to warmth and contamination from the cowshed. It is needless to multiply particulars. The conditions were thoroughly insanitary, and were such as to lend point to the bacteriological report of Professor Delépine on November 12th, which is here inserted:—

"The Owens College, Manchester,
225. "November 12th, 1894.

"*Preliminary Report on a Sample of Milk received from Dr. Niven on November 8th.*

"*Monday's Milk from B—— House.*

"Milk coagulated, sour smelling, with strong acid reaction.

"It contains numerous micro-organisms.

"Among those isolated by plate cultivation, one has the character of the Bacillus coli communis. This indicates sewage or fœcal contamination. It is probable that *by accident some contaminated water* found its way into some of the vessels used for collecting or distributing the milk.

"A virulent form of this Bacilli is capable of producing severe gastro-enteritis.

"Two tame (young) rats and two guinea pigs were given large doses of this milk, without effect. It is therefore evident that the illness produced by the milk was not the result of a simple poisoning.

"SHERIDAN DELÉPINE."

"Nevertheless, there seemed something unexplained, and in any case it was desirable to ascertain more about the extent of the mischief done. I had already, on November 7th, sent an Inspector to the farm for a list of the customers supplied with milk from the cows on the farm. He brought me back a few names of people who had not been ill. On visiting the farm on November 9th I insisted on having a complete list of the customers—those supplied with morning's being discriminated from those supplied with evening's milk. Such a list was subsequently sent, but I may say that I put no great value on any statements made with regard to the exact allocation of the milks respectively from the farm, and from the supplemental supply in Derbyshire. In any case no distinction in the number of attacks is observed between those said to have been supplied, respectively, with morning's and evening's milk. So far as it goes, this would seem to exclude the fouling of one particular pail or of one particular supply as the cause of the disease.

"The list of customers was divided on November 12th among the respective District Inspectors, who made an inquiry into the occurrences in the different families on the list.

"It was possible from the same list to ascertain approximately what medical men must have attended the families attacked, and a letter was addressed to these, requesting them to be kind enough to give a brief account of their cases. The account thus obtained has not been completed, but reveals that the second list supplied had not been a full one, and showed conclusively, if further proof were necessary, the dependence of the illness on a particular milk supply.

"On November 15th, Inspector Lord found the milkman who had left the farm, who informed him that a cow had been removed about November 2nd.

"He also visited the farm in Derbyshire from which the supplemental milk supply came, and on November 17th he proceeded to trace the cow which had been removed.

"On November 19th the farmer came and confessed that on November 6th his attention was called to a cow with 'gargil'—*i.e.*, inflamed udder—the milk of which had been at that time, and was also on November 7th, mixed with the milk of the other 12 cows on the farm. This cow was removed from the farm on November 8th, and on November 10th was slaughtered and sold for food.

"'Gargil' or 'garget,' I am informed, is an acute inflammation of the udder, which often leads to extensive sloughing, and sometimes has fatal consequences. In an article in the 'Medical News' for August 8th, 1891, Dr. Tower, of Milwaukee, gives a drawing of the microscopic appearances of a sample of milk from such an udder, showing streptococci and collections of micrococci. I am not aware of any similar outbreaks which have been ascribed to a case of gargil.

"Altogether, 160 cases of illness have come to my knowledge in 47 families, none of them fatal. In 49 families amongst those given in the list of consumers no illness was experienced. It is probable, however, that many of these had not partaken of the milk. The total yield of the cows was given to me by the farmer on November 9th as seven gallons at one milking—*i.e.*, 112 pints in the day. Now a number of the households were very large, and this would not have sufficed for them. Moreover, at the same visit, I was assured that the families in Victoria Park were exclusively supplied with milk from the farm. These nearly all suffered from the use of the milk, and, therefore, I consider it likely that a number of the other families had other milk.

"In endeavouring to form a judgment as to what was the element in the milk producing the mischief, one had to consider the nature of the occurrence. The great majority of the illnesses began on the night of November 5th and early in November 6th. Evidently something new was imported into the situation. It is true that there was plenty of material round the farm to cause disease, and the abundant presence of bacterium coli commune in the sample examined by Professor Delépine was quite in accord with the conditions to which the milk had been subjected on the farm. But, then, it had been for years subjected to similar conditions, and nothing had taken place. Moreover, with so many members of the family suffering from diarrhœa, it is possible that some contamination might have occurred in the house where the milk was obtained. The teats of the cows were far from clean at my visit, and the bacterium coli commune might have entered in that way, or it might have been introduced by contaminated water, and, as I have mentioned, the water with which the pails were washed could not be regarded as other than contaminated. But it was felt that there was something altogether new, and probably arising from something fresh imported into the situation, and that this something was probably disease in man or cow. Hence our persistence of inquiry. As it turned out, one out of 13 cows was acutely ill, and the period of its acutest illness covered the period of the outburst. The farmer says that he became aware of the illness of the cow on November 6th, and it may be assumed that it had been ill a day or two before then. It does not go for much, but he himself evidently at once ascribed the outbreak to this cause, and felt it necessary to remove the cow, and to deny having had anything of the kind. The weight of probability is, I think, otherwise greatly in favour of this cow having been the origin of the outbreak. We have thought it advisable to investigate this subject further. Mr. King has undertaken to get some udders from cows suffering from 'gargil,' and Professor Delépine has undertaken to investigate the bacteriology and pathology of milk from them.

"A detailed account of a number of the cases has been sent me by the medical men in attendance. It shows the time of attack, and, when ascertained, how much milk was used. Taken along with Professor Delépine's report, it appears to point to bacterial growth as against the action of toxines.

"I have not been able to find an account of any outbreak similar to the above, although it seems likely that such must have taken place.

"An interesting account is, however, given by Professor Gaffky in the 'Deutsche medicinische Wochenschrift,' xviii., 14, 1892, of an illness characterised by rigor, diarrhœa, and fever (up to 105·8°), with very severe general symptoms, and followed by prolonged convalescence, occurring on the same day in the assistant chemist and servant at the Institute in Giessen, in consequence of partaking of milk. The source of the infection was found in a cow suffering from hæmorrhagic inflammation of the intestines. The same bacilli, short, very motile, and pathogenic for mice and guinea pigs, were found in the dejecta of the cow and of the patients. They were, however, absent from the milk. It is inferred that the milk of the cow must have become contaminated with dejecta.

"A matter of some consequence in the local outbreak is the strong belief entertained at one household affected that the milk used had always been boiled. In other families this seemed to have prevented the illness. But there is no doubt whatever that the bacteria concerned in the outbreak were capable of resisting tolerably high temperatures, since, in some instances, the milk, the use of which had been followed by attacks, was warmed, and in other cases mixed with warm tea or coffee. Professor Flügge in an article in the 'Zeitschrift für Hygiene und Infections-Krankeiten,' xvii., 2, p. 272, 1894, quoted in 'Schmidt's Yahrbuch,' discusses the effect of heat on the sterilization of milk; he finds that the anäerobic bacteria which are to be found in almost every milk, do in part resist boiling for a period of 1½ hours. 'Of much more consequence, however, are the peptonising bacteria. which are frequently present in enormous quantities, grow best at a high temperature, possess a dangerous tenacity of life, not altering the milk perceptibly for a considerable time, though gradually imparting to it a bitter taste. Amongst the twelve species encountered were three which were found on several occasions in the ordinary milk of commerce, and which appear to have a special importance, inasmuch as their pure culture in milk evoked severe toxic effects in different experimental animals, and in young dogs especially produced violent diarrhœa, often leading to death. The spores of these peptonising bacteria stand heating in water or steam up to 100° C. for two, and in part even up to six hours; the ordinary heating up to 100° for about three-quarters of an hour does not destroy them.' Professor Flügge concludes that the ordinary process of sterilizing milk by boiling is insufficient. In spite of that, a very large proportion of the infectious germs present in milk will be destroyed by boiling, sufficient to prevent many of them from reproducing disease. But it would certainly seem that we cannot afford to neglect other precautions in the conservation of milk, even if we do have it boiled before use.

"In the course of this inquiry several questions of general moment have come up. If we are to assume that the infection in this case was due to disease in the cow, yet how far was this disease attributable to the grossly insanitary conditions to which the cows were subjected? In order to elucidate this question I inquired into the previous history of cows on the farm, and was informed that there had been no disease among the cows for seven years. Seven years ago nine cows were said to have died one after another of a disease characterised by rapid onset, weakness, and staggering. The exact nature of this disease, apparently, no attempt was made to clear up. I do not, however, after the persistent attempt to conceal the fact that one of the cows had suffered from 'garget,' place much reliance on this statement. Several of the cows at our visit had a temperature of 101° F., and one had a temperature of 102° F. In regard to this one, Mr. King was inclined to think that it was tuberculous. I can scarcely believe that animals placed under such conditions as existed on this farm would escape disease for seven years.

"Then, again, how far are such conditions limited to individual farms, and how far are they general? From my previous experience of dairy farms in a neighbouring district, I should say that they are far below any standard of sanitation which should be tolerated; and from what I have heard of the keeping of cows in and around Manchester, the whole trade must require investigation and amendment. But it would scarcely be possible to establish a high standard in one district and allow surrounding districts to retain their old conditions. To obtain the maximum of advantage from an improvement in the methods of dairy farming, this must be made general. For that purpose I would venture to suggest that a uniform code should be applied to all cowsheds, both in and outside our large towns, and that this should not be too stringent in regard to existing cowsheds, so far as the size of cowsheds is concerned. Also that Veterinary Surgeons, at an adequate salary, should be appointed to districts to make periodical examinations of the farm premises, and of the stock. They would be required at once to report any insanitary conditions on the farms, or any disease in the cows, to the Sanitary Authority in whose district the farm or cowshed lay, so that adequate measures of prevention might at once be taken.

"I cannot help thinking that many such occurrences as the above must take place, though on a more limited scale, and that a large amount of bad health, especially in infants, must be produced by an impure milk supply.

"It is the more necessary to exert ourselves in improving the state of the farms and the conditions of milk storage if, as Flügge's results indicate, boiling affords an insufficient protection against impurities in milk.

"The directions in which amendment are most urgently called for are these:—

"1. The removal from the milk supply of all milk from diseased cows, or from cows in an abnormal condition, and the prompt removal from the cowshed of diseased cows.

"2. The supply of pure drinking water to the cows.

"3. Cleanliness about the farm. The teats and udders of the cows should be carefully cleaned before milking, and milked with washed hands. They are, as a rule, merely stripped, often with dirty hands.

"4. Adequate space, lighting, and ventilation should be provided.

"5. The milk pails and vessels should be scalded after each milk round, and carefully cleansed.

"6. The milk should be stored on the farm in a dry, well ventilated, and clean place.

"7. When retailed in shops it should be protected from dust.

"8. It should be sterilized before distribution, if possible.

"MEDICAL OFFICER OF HEALTH.

"The Hospitals Sub-Committee."

It will be seen from this report that the condition of the farm from which the incriminated milk came was such as almost certainly, at one time or another, to lead to disease in the milk consumers. Nor is this an isolated instance of an insanitary farm in this part of the country. I had occasion while Medical Officer of Health for Oldham to report on the condition of the cowsheds of that district, and the descriptions of these given in the Annual Reports for Oldham amply show how injuriously the state of the cowsheds must have acted on the condition of the animals housed in them, as well as on the milk after it left the cow.

I have recently had an examination made of the cowsheds in the City of Manchester, which reveals conditions similar to those previously found in Oldham. Generally speaking, these cowsheds are badly lighted and badly ventilated, and indeed in many instances are so constructed that it would be a very difficult matter to keep them clean. Under such conditions, when tuberculosis has once entered a cowshed, it will be very difficult to eradicate, since there are no facilities for thorough disinfection, nor a sufficient amount of light to destroy any infective matter.

In considering what precautions are required to prevent milk from inflicting disease upon its consumers, we may profitably trace it from the cow to the purchaser.

First, then, as to the cow, the cow may be suffering from disease, and especially from tuberculosis. This is more likely to be the case with cows housed in the City than with cows on country farms. We are probably safe in estimating that at least 15 per cent. of the milch cows in the City are tuberculous. It has been abundantly shown that the milk from tuberculous cows frequently contains the virus of tuberculosis in an active form, and the recent report of the Royal Commission on Tuberculosis emphasises the danger of using milk from cows with tuberculous disease of the udder. Other diseased conditions of the udder are also liable to produce disease. The greatest care should be exercised in the exclusion of milk from any cow suffering from any affection of the udder, and indeed it should be made penal to add the milk from any cow even temporarily ill to the general stock when there is clear evidence of disease, especially if such disease is of the udder. It is no difficult matter to ascertain the existence of such disease, and this duty is now imposed on your Veterinary Surgeon (Mr. King), who cannot, however, I believe, inspect the cows in Manchester systematically and perform his other duties without assistance.

Then, again, in milking the cow the greatest care should be exercised, and it should not be possible for milkers, with impunity, to milk cows without previously cleaning the teats, udders, and their own hands. Nor should anyone with sores on their fingers be allowed to milk cows.

The next point at which infection may reach the milk is while it is in the pail in the cowshed, or after it has been poured from the pail into which it has been milked into the large milk-can. Such infection may arise from two causes, either from dirt floating in the cowshed or from neglect to thoroughly cleanse the pails and cans. In the Oldham district the cowsheds are littered with cotton shoddy, and it is not uncommon for the air in the cowshed to be thick with cotton fibre. The introduction of dirt in this way is not so likely to occur when straw is used, but in all cases the cowsheds should be thoroughly cleansed before milking-time—say an hour before. The possibility of such systematic cleansing presupposes that the surface of the floor is comparatively even, and such as might be obtained by a rough form of concrete.

If the cowshed is not frequently cleaned out, in addition to the risk of contamination to the milk, there is danger of infection—especially to the attendants—in connection with the frequent presence in the cowshed of tuberculous animals. The tubercular infection brought up from the lungs of the cow is, no doubt, swallowed, and voided with the ejecta. If the ejecta are allowed to dry in the cowshed the tubercular infection is dispersed in the air and settles on the walls, giving rise to tuberculosis in sound cows and in the attendants.

The structural conditions of the cowshed are of primary importance, both on account of their effect on the health of the cows and on account of regular cleaning. Every cowshed should be a separate building, lighted from both sides, having a floor of concrete reasonably even, and channels behind the cows leading to an opening in the drain, which should be outside the cowshed. The internal walls should be of cement, or of some material easily cleaned, and the ceiling should be easily accessible from below in every part. Ventilation is probably best supplied by movable louvres in the walls and fixed louvres in the roof. Each cow should have a separate stall.

To return to the milk. The pails themselves should be rinsed with boiling water, care being taken to clean both the cans and the lids between each milking, and at the same time to thoroughly cool the cans before milk is placed in them. The necessity of using boiling water arises from the frequent presence of impurities in the water, especially on outside farms. It is scarcely necessary to observe that no milk should be distributed from any farms on which there is any case of those infectious diseases known to render milk a source of danger.

In the majority of instances, milk is taken directly from the cowshed to the place of distribution. Where this is not the case it is placed in the store-room, which is frequently underground. The best store-room is that which is separate and above ground, with side walls facing east and west, and abundant cross ventilation, remote from dust. It is, however, a mistake to suppose that a cellar is necessarily injurious to milk, provided it is so ventilated as not to admit dirt. On no account should other articles than milk and butter be allowed in the store-room. I have found, from experience, that it is difficult to get this precaution observed, such articles as rags and old boots being kept alongside the milk.

We may now follow the milk from the farm to where it is to be distributed, and we will suppose, in the first instance, that it is taken direct to the consumer. A measure can is usually dipped into the bulk of milk contained in a large can on a float in the street, where the milk is often exposed for a considerable time to the street dirt. This should, at all events, be stopped, and some means adopted by which the milk is not exposed to dust. A large proportion of the milk, again, is sold in small shops, a considerable quantity passing through intermediate depots. If taken to such a depot, it is, of course, liable to fresh infection at that point; and I well remember a considerable outbreak of typhoid fever occurring in Newton Heath, due to milk which had apparently become contaminated at such a depot in the Ancoats district.

When the milk has reached the small shops, dangers to its purity increase, since it is not only exposed to the dirty conditions which we have seen to be frequent in these places, but, if any infectious disease occurs in the house attached to the shop, it is liable to become badly contaminated.

When we add to all these preliminary contaminations subsequent exposure to the dirt so frequently to be found both in and round the dwelling, as well as in the feeding-bottles for infants, it is no wonder that so many children suffer from the consumption of this necessary article of diet.

What, then, are the directions in which action is called for to lessen the dangers arising from these causes?

The experience of Danish dairy farming has shown that, from a commercial point of view, attention to the utmost hygienic requirements can be combined with pecuniary profit. It is well known that by the Danish Dairy Companies the very greatest care is bestowed on the housing of the cows, and on the selection of milk, whether for immediate consumption or for the making of butter and cheese. If a cow is in any way diseased, its milk is excluded from use. That is, no doubt, the direction in which we must look for a thorough reform in our milk supply. Such a reform can, however, only very gradually be brought about. It would, however, conduce very much to such a beneficial change if a Milk Company, prepared to carry out the strictest requirements, were established in this district on a commercially successful basis. It has been suggested to me by an Alderman of this City, who has taken much interest in the subject, that a company of the same character as the Copenhagen Milk Supply Association might with great advantage be established in Manchester.

From a personal examination into the workings of the establishment hereafter described, he is of opinion that if £5,000 could be raised it would be sufficient to start a Milk Collecting and Distributing Company, whose object would be to gather the milk from sanitarily-conducted farms, and after certain purification and examination distribute it in a pure condition and at a cheap rate in our working-class districts, where it would be so helpful, especially for the nourishment of children. If, say, 10 or 20 gentlemen would combine and contribute the above sum on the commercial basis of receiving interest up to 5 per cent., a great boon would be conferred on the City.

What may be effected by private enterprise is clearly shown in the history of the Copenhagen Milk Supply Company, as given in a little book by A. Stewart MacGregor, British Vice-Consul in Copenhagen, published by Scott and Ferguson and Burness and Company, Edinburgh, 1890, price 1s., which will be found extremely interesting and instructive for anyone who takes an interest in the subject. This book well illustrates what may be effected by the indomitable energy of one man in a comparatively brief period. It is now only 17 years ago since Mr. G. Busck was stimulated to the endeavour to obtain for Copenhagen milk which should be clean, pure, and wholesome, and the product of cows well tended and properly fed. Actuated mainly by a desire for the public welfare, he has completely revolutionised the method and quality of the milk supply to Copenhagen. The Milk Supply Company have a large establishment outside the City, where the milk is manipulated and prepared for distribution. To this establishment farmers who have contracted with the Company send their milk in cans, which have been cleansed both by the Company and by the contractors. The magnitude of the operations carried on by the Company may be estimated by the following figures. In October, 1889, they were supplying milk from 4,300 cows on 50 farms. In the same year the daily supply to Copenhagen was over 37,000 pints. Special regulations secure that the milk has been kept below 50° Fahrenheit when it reaches this establishment. The arrangements made with the contractors are such that they have no inducement to conceal the presence of infectious disease among their workpeople, or any illness which may have assailed the cows. On the other hand, the condition of the cows, the cowsheds, the stores, &c., at the farms is subjected to rigorous inspection by a staff consisting of Veterinary Surgeons, an Inspector, and Dairymaid, a fortnightly report being made by the Veterinary Surgeon, and occasional reports by the Inspector and Dairymaid.

When the milk arrives at the Central Establishment samples are taken for analysis, and the temperature is noted. The skimmed milk and ordinary sweet milk are placed in the cans in large ice tanks, there to remain till early next morning, when they are run through a filter, and tapped off into the vessels in which they are to be taken round the town.

The cream, after being weighed and sampled, is filtered, and then bottled in clear glass bottles, which are laid away in ice until delivery next morning. The infant milk—so called on account of special precautions having been taken to secure its absolute purity and wholesomeness—is likewise put through another filter, and bottled.

The amount of dirt which is intercepted by these filters, in spite of every precaution, is surprising. A full description of all the arrangements is given in the book mentioned. To enter into detail in such a manner as to convey a clear idea of the operations would take up too much space, but I would again strongly commend the book quoted to those interested in the question of a pure milk supply. It is a great matter to have shown that such elaborate arrangements for the purification of the milk have been carried out so as to produce a profit to the Company. What can be done for Copenhagen can surely be done for Manchester.

Short, however, of a radical alteration in the management of our farms, much may be done to safeguard the interests of the public, so far as milk is concerned. All the intermediate exposures of milk to dirt and infection in the streets and shops might be avoided by the simple expedient of conveying milk in bottles, which must, of course, be thoroughly cleansed with boiling water before use. Here, again, a Milk Supply Association would be useful in cleansing, bottling, and distributing the milk. The present plan of distributing milk is altogether bad, and, where the distribution in bottles was found inconvenient, there should be no possibility of admitting dust to the milk. This could be avoided by the use of milk cans with sealed lids, a tap to run off the milk, and an air-pipe in the upper part of the can, the mouth of which could be occupied with some straining material such as cotton wool. The air-pipe, however, might simply be placed vertically.

A considerable difficulty will no doubt be experienced in getting the various farmers supplying this district to fall into line. It is manifest that a decided effort should be made to bring about a general and simultaneous effort on the part of Sanitary Authorities to improve the conditions of milk production. Nevertheless, without sustained exertion, no improvement at all is to be looked for, and I have therefore endeavoured to indicate some of the directions in which action may be most beneficially undertaken.

Whatever other measures are taken, popular instruction will still remain necessary, and will indeed be a valuable auxiliary in carrying out any reforms inaugurated. By handbills distributed by the various Registrars, and by the handbills relating to Consumption and Diarrhœa, every household in Manchester has been warned of the urgent need for boiling all milk used, so as to counteract the injurious effects of dirt to which it may have been exposed. I also endeavoured, at the end of last year, to get cards hung up in all milk-selling establishments warning consumers to boil their milk before use, in order to diminish the risk from certain diseases. To my great surprise, I was waited upon by a deputation from the Milk Dealers' Association, requesting me to have this card withdrawn, as it was likely to injure the sale of milk. I regret to have to record that in many shops this card has not been hung up.

To sum up, these measures are recommended for the protection of milk :—

1. The improvement and continued inspection of cowsheds from which milk is supplied in the City, as well as the systematic inspection of the milch cows, with the removal either temporarily or permanently of cows suffering from disease.

The establishment of a Milk Supply Association, having for its special object the provision of a pure milk supply, would be an immense furtherance of this object.

In the meantime, adequate bye-laws for the regulation of Dairies, Milkshops, and Cowsheds in Manchester are required, as well as the staff necessary to see that they are carried out.

2. Milk in transit from the farm to the consumer should be protected by adequate provision for its cleanly conveyance, preferably in bottles.

3. No effort should be spared to instruct the public as to the necessity of a sufficient protection of the milk supply, and of how to guard themselves against the risks arising from the present extremely defective conditions of milk farming and of milk distribution.

Note A.—On Regulations Applicable to Dairies, Cowsheds, and Milkshops.

By the Dairies, Cowsheds, and Milkshops Order of 1885, it is prescribed that anyone carrying on the trade of a cowkeeper, dairyman, or purveyor of milk must be registered; and by the Dairies, Cowsheds, and Milkshops Amending Order 1886, an offence against the Order of 1885 renders the offender liable to a penalty of five pounds.

In May, 1879, regulations were passed by the Council under the Dairies, Cowsheds, and Milkshops Order of 1879, which was revoked by the Dairies, Cowsheds, and Milkshops Order of July, 1879, which again was revoked by the above-mentioned Order of 1885, but with a saving for local regulations previously made. How far these regulations have been observed I am not in a position to say. Certainly a register has been kept in the Sanitary Department of cowkeepers, dairymen, and purveyors of milk. Even supposing the regulations mentioned to have been strictly carried out, they make no provision for the lighting and ventilation of cowsheds. It is quite certain that due provision of light and an adequate supply of fresh air are just as necessary for cows as for human beings. It would be quite possible for cowsheds in Manchester to fulfil these regulations, and yet to be utterly unwholesome for the cows in them.

Then, again, the Dairies, Cowsheds, and Milkshops Order of 1885, section 15, provides that if at any time disease exists among the cattle in a dairy or cowshed, or other building or place, the milk of a diseased cow therein

(*a*) Shall not be mixed with other milk; and

(*b*) Shall not be sold or used for human food; and

(*c*) Shall not be sold or used for food or swine, or other animals, unless and until it has been boiled.

But in order that this valuable section may be enforced, systematic inspection is clearly necessary by a Veterinary Surgeon, and such skilled assistance should be given to your veterinary surgeon as will enable him to systematically and properly inspect the cows in the Manchester cowsheds, and to exclude from consumption the milk from diseased cows.

Moreover, a new set of regulations should be at once prepared, such as will enable your officers to enforce on cowkeepers a reasonable standard of sanitary conditions in the cowsheds. It matters not who prepares these regulations, but there should be no unnecessary delay in getting them passed, since little improvement can be effected until definite rules are laid down to guide your officers, and also for the guidance of magistrates.

Note B.—Instruction on the Principles of Hygiene and on Cooking.

It is of the utmost importance, in order that the great progress in sanitary reform of recent years should be consolidated and expanded, that adequate instruction should be given in our schools on the Principles and Practice of Hygiene, and no less important that adequate instruction should be given to all girls in cooking. To take first the subject of cooking. This should embrace practice in cooking a sufficient variety of dishes, as well as instruction on the foods best suited to the nourishment of the body at different ages, with a due regard to economy. It should also include the selection of foods. For the general diffusion of such knowledge, clearly the first thing requisite is a supply of teachers well versed in the subject they profess to teach. This is provided for in the School of Cookery at South Parade, off Deansgate, which grants certificates of competency to teachers of cooking who are not necessarily otherwise certificated teachers. There is also another School of Cookery in Arlington Place, Oxford Street. There is thus no scarcity of teachers in Manchester, and indeed I am informed by Mr. Wyatt, the able Clerk to the School Board, that, with the exception of some of the poorer voluntary schools, practical instruction is given to all girls who have passed the Fourth Standard—that is to say, generally speaking, to girls over eleven years of age—who continue to have instruction for a period of about two years. The grant for cooking, he tells me, does not cover the expenses in regard to apparatus, &c., which is no doubt the reason why the schools mentioned have not taught this branch of knowledge. No one acquainted with the habits of the artizan class in Lancashire could doubt how great an accession such a practical knowledge of cooking would be to most households, as regards economy, comfort, and health.

As I have previously suggested, instruction in this subject might with profit include also hints as to the proper storage of food. Admirable directions to teachers are given in the Manchester Practical Cookery Book, sold for sixpence, page 68. Provision is made for a Government Grant in respect of the teaching of cookery in the Education Department's Code of Regulations for Day Schools, 1895, page 23, and in the Code of Regulations for Evening Continuation Schools, 1894, page 4; and again I would express the hope that such teaching will be made universal and thorough.

For teaching the elementary principles of hygiene, also, adequate arrangements are made; and here, as is quite proper, a knowledge of food stuffs takes a very prominent place. (See Evening Continuation Code, 1894, page 31, and Regulations for Day Schools, 1895.) Such teaching, however, appears to be confined to the older scholars. It demands, equally with cooking, careful training of the teachers. I am informed that lectures have been given to teachers on this subject at the Science and Art School.

There is no want of text-books. In particular, I may mention "The Making of the Home," by Mrs. S. A. Barnett; a "Manual of Health Science," by Mr. Andrew Wilson; and Dr. Reynold's excellent little Primer. These text-books are adapted for the Evening Institute for Women and Girls, established by the School Board in 1891. They are, however, suitable only for older pupils, and it is desirable that a knowledge of the principles of hygiene, so far as they are applicable to the ordinary conditions of life, should become deeply ingrained in the minds of young people. To effect this, Mr. Wyatt suggests to me that probably the best way would be to insert interesting articles in the General Readers—a suggestion with which I thoroughly agree, and which I hope to assist in carrying into practice.

Amongst the agencies which are at present available for the diffusion of knowledge in regard to sanitary matters, the principal are:—

1. The numerous societies and lecturers in Manchester who devote so much time to teaching working people. Of these the most important is the Manchester and Salford Sanitary Association, whose publications represent a great amount of useful work done by many prominent men. It is much to be hoped that their efforts in this direction will not be relaxed. It has been suggested to me that it would be well for the purposes of such lecturers, and also for use in schools, to have a large number of lantern slides made, illustrating health teaching. I quite think it would be a great gain if this idea were taken up by a number of our amateur photographers, under the direction of a consultative committee, who would arrange the subjects to be illustrated, and the modes of illustrating them. Such slides would be distributed at a small charge for purposes of instruction.

2. The second centre for the diffusion of knowledge is the Sanitary Authority, and as their operations are necessarily more far-reaching than those of isolated Associations, so their responsibility is greater. With the aid of the police, it should be easy, and not expensive, to convey knowledge on important matters to every house in the City. In 1894 an effort was made in that direction, and I would cordially acknowledge the courtesy of the Chairman of the Watch Committee and of the Chief Constable in this matter. Handbills, here reproduced, were sent to every house in Manchester on the "Prevention of Consumption" and "Summer Diarrhœa." (See pages 118 and 119.)

PRECAUTIONS AGAINST THE COMMUNICATION OF CONSUMPTION.

1. Consumption is an infectious disease, liable to be communicated more particularly in damp, badly ventilated, and badly lighted houses and workshops.

2. It is usually communicated by the matters coughed up by consumptive people, which get dried and dispersed as dust, thus reaching the lungs of those susceptible to the disease.

3. Such matters should, therefore, never be allowed to get dry. For that reason they should not be spat on the floors of a house, but either into pieces of rag or paper, which should be at once burned, or into a hand-vessel containing water. This vessel should be emptied into the drains outside the house once a day, and then scalded and re-charged with water.

4. Everyone affected with a chronic cough should take the same precautions as a consumptive person.

5. The same precautions should be observed in a workshop as at home.

6. Consumptive people should not spit into a pocket-handkerchief, as both the handkerchief and their clothes are thus made infectious.

7. No one should spit on the ground inside any building or in a public conveyance.

8. The bowel discharges of consumptive people should be disinfected by being passed into a 15 per cent. solution of carbolic acid, or simply into water, and the vessel, when emptied, should be at once scalded. Soiled clothing should be at once removed, disinfected, and afterwards boiled.

9. When it is settled that anyone is consumptive the house should be thoroughly disinfected, and the patient should be thenceforward confined to certain parts of the house. On a request made in writing to the Health Office, disinfection will be carried out by the Department free of charge.

10. The rooms occupied by a consumptive person should be kept well ventilated and well lighted. This will aid greatly in destroying the infection.

11. No one is more liable to inhale the dust from matters coughed up than the consumptive himself. The removal of infectious matter is, therefore, calculated to promote his recovery. Moreover, if these precautions are strictly carried out, he need not be a source of danger to anyone.

12. It is the duty of the attendant to see that the above precautions in regard to the phlegm and discharges are observed, and also to see that every obstacle to sufficient lighting and ventilation is removed.

13. In case of death, the house will be disinfected by the Sanitary Authority, if this is desired. A new tenant should not enter a house previously occupied by a consumptive person until such house has been thoroughly disinfected.

14. Amongst the agencies which act powerfully in causing Consumption are damp dwellings and workshops, overcrowding, defective ventilation, occupations which involve the inhaling of irritating dust, and alcoholic excess. These should be avoided.

15. The milk from consumptive cows is very dangerous, especially to children. All milk should be boiled before use. As many animals suffer from Consumption, all meat should be thoroughly cooked.

Public Health Office,
Town Hall, Manchester,
May 28th, 1894.

MEDICAL OFFICER OF HEALTH.

PRECAUTIONS AGAINST SUMMER DIARRHŒA.

1. All milk should be boiled before use.

2. Infants fed by hand suffer in a far greater degree from Diarrhœa than infants fed at the breast. When they have to be fed by hand they should get only milk, and not be fed on "pobbies."

3. Children's food should be freshly prepared. When it is necessary to keep milk in the warm season it should be boiled and stood in a clean jug or dish, covered over with a clean cloth.

4. All food should be kept in a clean, dry, and well-aired place.

5. Meat and fish should be carefully examined on purchase, and no tainted food should be bought. Food which has become tainted after cooking should be rejected. Fruit should be carefully selected and cleaned.

6. Overcrowding is a cause of Diarrhœa. During the warm season bedroom windows should be left open day and night, and the fireplace should be kept open. Bedroom walls and ceilings should be lime-washed early in summer. If the room is papered, the paper should be cleaned. Overcrowding should be avoided.

7. All dirt should be removed from the house. The floors should be frequently scrubbed with soap and soda. Dirty paper should be removed. If the walls under the paper are dirty or broken, the paper should be removed and the walls made good and cleansed.

8. Damp foundations or dirt under a house are conducive to Diarrhœa.

9. Any accumulation of an offensive character near a house, whether arising from loose flags, from defective drainage, from collections of manure improperly kept, or from defective cleansing of privies, should be reported to the Sanitary Office or to the Medical Officer of Health at the Town Hall. Other deposits near a house will require to be removed at once by the householder.

10. The yards should be kept clean, and the drains flushed with a few buckets of water daily.

11. The ashtubs should not be allowed to overflow, nor should vegetable refuse be put into them. Tea leaves, cabbage leaves, fish, potato peelings, &c., should be burned in the kitchen fire. No liquid should ever be placed in the ashtub.

12. Where any offensive smell is perceived in or near a house, the cause of which cannot be ascertained and removed, complaint should be made to the Sanitary Office, Town Hall.

13. Diarrhœa Mixture may be obtained, free of charge, by poor people, at the Ancoats Hospital, at the several Police and Fire Stations of Manchester, at the Ardwick and Cheetham Town Halls, at the Jewish Board of Guardians, and at the City Police Courts; also at the Public Health Office, in this Town Hall, and at the various Cleansing Depots of the City.

Public Health Office,
Town Hall, Manchester,
May 28th, 1894.

MEDICAL OFFICER OF HEALTH.

The following handbill, containing suggestions to householders, has also been widely distributed:—

CITY OF MANCHESTER.

SUGGESTIONS TO HOUSEHOLDERS.

1. Whatever trouble it may involve, and however discouraging your surroundings, your house and yard (if any) should be kept clean throughout. Dirt is the greatest enemy to Health.

2. If the doors, walls, floors, windows, or staircases of your house are broken, or faulty, you should insist on having them put right. If you cannot get them put right, you should complain to the Health Office, Town Hall.

3. If the roof is defective, admitting rain, or if the walls are damp, you should complain to the Health Office.

4. If the floor and walls near the floor frequently show damp, the house is dangerous to live in.

5. The floors should be kept scrupulously clean. Hence you should not have a rag mat or other hearthrug which can lodge dirt, but use only washable materials, and wash them from time to time.

6. Vegetable and other refuse should not be allowed to accumulate in the house, but should be burned in the kitchen fire.

7. The contents of the chamber utensils should be emptied first thing in the morning, and it is necessary to remember that they may be dangerous to the inmates of the bedroom.

8. Bedrooms should be limewashed at least twice a year. This is a very important means of purifying rooms, in conjunction with light and fresh air. The rooms should be limewashed, not whitewashed.

9. Light and fresh air are the great purifiers of a house. Hence you should choose a house which is not darkened by adjoining buildings. You should, as far as possible, remove all curtains from the bedroom windows in the daytime. Any curtains used in other rooms should be of a fine texture, and such as to allow light to pass through.

10. To get as much fresh air as possible you should open your bedroom windows every morning and leave them open all day, whenever you can. "Sand rollers" should not be put on the window frames to stop the passage of fresh air. Wooden blocks, at a charge of 3½d. each, may be had from the Health Visitors for putting underneath the lower sashes of windows, so as to direct a current of air upwards into the room.

11. If the yard is broken or the drain stopped, and you cannot clear it, you should at once make a complaint to the Health Office.

12. You should examine the ground under your closet seat, and if it is at all dirty, or if the urine-guide is broken or wanting, complaint should be made. It is most essential that the ground near the privies should be kept clean and dry.

13. **FOOD.**—The utmost care should be exercised in feeding young children, and accompanying this is a paper of instructions. All food should be kept in a dry and well-aired place. Milk should be well boiled when brought into the house, and then covered over, and should not be kept for more than twelve hours before use. Soups should not be used after standing in the house without being again boiled.

14. Alcohol should be avoided, except for old people, and in case of illness. The too free use of alcohol by degrees undermines the health, and takes away the pleasure and usefulness of life.

Public Health Office, Town Hall, MEDICAL OFFICER OF HEALTH.
Manchester, January 21st, 1895.

Then, again, a large amount of infant mortality is due to ignorance on the part of mothers as to how to feed their infants, and arrangements have been made with the Registrars throughout the City to have the following handbill on "Infant Feeding" handed to every parent who comes to register the birth of a child. This is a proceeding which had been previously adopted by Dr. Hill, of Birmingham.

HOW INFANTS SHOULD BE FED.

With some additional observations.

1. Infants should, whenever it is at all possible, be fed at the breast for a period of six months at least; but if that cannot be done, for as long a period as may be. Breast milk is, almost always, much more wholesome for an infant than cow's milk.

2. They should have the breast not oftener than every two hours during the day, and every four hours during the night. At the end of three months they should be suckled at longer intervals. When they are fretful or suffer from indigestion, it will often be found that they are being overfed, and diminishing their diet will then put them right.

3. The mother should, in order to supply wholesome milk to her child, partake only of plain and wholesome food, avoiding intoxicating drinks such as spirits and beer. If she suffer from sore nipples, they should be washed with warm water after the child has fed, and some glycerine should then be applied.

4. When, from want of milk, or from an absolute necessity of going to work, a mother cannot suckle her infant, the next best thing, as a rule, is to feed it on cow's milk, prepared thus :—

Half a pint of good fresh milk and one pint of water, with a small teaspoonful of white sugar, are mixed and boiled, and then placed in a clean jug, covered with a clean cloth. Four tablespoonfuls of this should be placed in the feeding bottle each time it is used, and after each time the child is fed the bottle should be cleaned, or a clean one used. The infant should not be fed oftener than every two hours in the daytime, and every four hours during the night. This will be the diet up to the age of six weeks.

When the child is at least six weeks old, one pint of cow's milk may be added to one pint of water, and eight tablespoonfuls used to each meal, the interval between meals being increased.

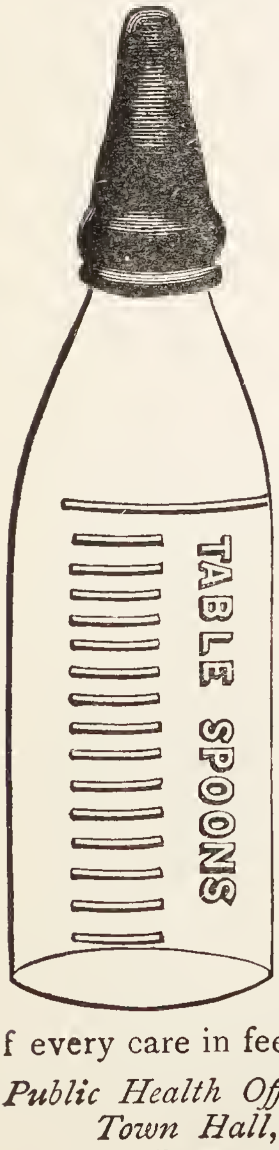
At the ages three to six months, two pints of cow's milk should be mixed with one pint of water, eight tablespoonfuls being used to each meal. The interval between meals, and the quantity used at each meal, may be increased as occasion requires; but it is necessary always to bear in mind the danger of over feeding.

In all cases the mixture of milk and water should be boiled and kept in a clean jug, as before mentioned. Only a small quantity should be got ready at one time.

Up to the age of six months it will generally be found better to use no other food whatever than milk. On no account should "pobbies" or other solids be given.

5. The bottle used should be of the shape shown in the woodcut. The indiarubber teat comes off, can be turned inside out, and can be easily cleaned with water containing soda. The bottle and teat should be cleaned after each use, the bottle with scalding water. Bottle, teat, and a cleaning brush may be had for about one shilling. It is absolutely essential to keep the bottle and teat clean.

6. In one of the Health Lectures for 1881-82 on "Infant Feeding," the following diets are given as useful :—



DIET FROM SIX MONTHS TO TWELVE MONTHS OLD.—*Five meals a day.*

First meal, 7 a.m.—One teaspoonful of some farinaceous food to about twelve tablespoonfuls of sweetened milk, mixed, and well boiled.
Second meal, 11 a.m.—The same quantity of pure milk.
Third meal, 1-30 p.m.—Same as first.
Fourth meal, 5-30 p.m.—Same as second.
Fifth meal, 10 p.m.—Same as first.

DIET FOR A CHILD FROM 12 TO 18 MONTHS OLD.

First meal, 7 a.m.—Bread and milk, or oatmeal or hominy porridge, with plenty of milk.
Second meal, 11 a.m.—Twelve tablespoonfuls of milk.
Third meal, 1-30 p.m.—Bread crumbs and gravy, or a slackly-boiled egg and bread and butter.
Fourth meal, 5-30 p.m.—Bread and milk.
Fifth meal.—Milk to drink.

For further instruction, the lecture alluded to (which may be had at John Heywood's for 1d.) should be consulted.

7. Infants should not be placed on the floor, as they are thus exposed to draughts and infectious dirt. They should be suspended at a height of at least two or three feet from the floor.

8. They should be warmly clothed, but not with many clothes. Their clothing should not fit tight about the body, but cling loosely, so as to give free play to the lungs. The limbs should be covered equally with the body. To allow a child to be cold is as bad as to deprive it of food, while giving it all the effort of digestion.

9. Mothers are strongly warned against giving children soothing medicines to send them to sleep.

10. When an infant continues to suffer from indigestion or diarrhœa, in spite of every care in feeding it, the mother should consult a medical man, who will advise her how to act.

Public Health Office,
Town Hall, Manchester,
June 15th, 1894.

MEDICAL OFFICER OF HEALTH.

An excellent handbill by Dr. Russell, of Glasgow, on the "Management of Infants" might also be profitably distributed along with the above. It will be seen that these instructions presuppose and require that the milk supplied to infants must be of good quality. To effect much good, it is essential that these efforts to instruct the public shall be kept up.

3. Of more consequence even than these methods of teaching the public is it that the children attending our schools shall be taught early in a simple and intelligible fashion how the home may be made healthy, and how their own lives may be made healthier, and therefore happier. To make such lessons of much value, the schools themselves should be an object lesson in respect of cleanliness, lighting, and ventilation. Not only should this be so for the sake of practical illustration, but also in order that the minds of the children may not be clouded and rendered unreceptive by insanitary conditions. In particular, every school should have adequate arrangements for the frequent change of air.

4. The valuable work of popular instruction done by the Ladies' Health Society in the poorer districts of the City also calls for special mention. The Medical Officer of Health's Quarterly Returns give a numerical idea of their operations.

ON BAKEHOUSES.

During the year much attention has been directed to the condition of the bakehouses in the City. It has long been felt that a large number of cellars used for baking were quite unfit for the purpose, being most prejudicial to the health of the journeymen bakers, and probably injurious to the quality of the bread baked in them. It is largely due to the energy of Dr. F. J. Waldo, Medical Officer of Health to St. George's, Southwark, that this question of the condition of bakehouses has assumed a practical shape. In 1883 the regulation of bakehouses was definitely transferred to the charge of the Sanitary Authority, and section 15 of the Factory and Workshops Act makes the following provisions for places not let or occupied as bakehouses before June 1st, 1883:—

1. No water-closet, earth-closet, privy, or ashpit shall be within or communicate directly with the bakehouse.
2. Any cistern for supplying water to the bakehouse shall be separate and distinct from any cistern for supplying water to a water-closet.
3. No drain or pipe for carrying off fœcal or sewage matter shall have an opening within the bakehouse.

By section 16, if a Court of Summary Jurisdiction is satisfied on the prosecution of a Local Authority that any place used as a retail bakehouse is in such a state as to be, on sanitary grounds, unfit for use or occupation as a bakehouse, the occupier of the bakehouse shall be liable, on summary conviction, to a fine not exceeding forty shillings, and on a second or any subsequent conviction not exceeding £5. The Court, in addition to or instead of inflicting such fine, have it in their power to order means to be adopted by the occupier within a time named in the order for the purpose of removing the ground of complaint, and may on application enlarge the time so named; but if, after the time so originally named or enlarged by subsequent order, the order is not complied with, the occupier will be liable to a fine not exceeding £1 for every day that such non-compliance continues.

It is evident that these two sections, if adequately enforced, supply the necessary means for dealing with cellar bakehouses. As regards section 15, it is clear by section 16 that if it can be shown that the conditions enumerated are such as to render the premises on sanitary grounds unfit for use as a bakehouse, then the fact of the place having been used before June 1st, 1883, is no defence; and, indeed, it is difficult to see how the presence of a closet in a bakehouse can ever be tolerable. Suppose, for example, one of the workmen to be suffering from an attack of ambulant typhoid fever, then taking into account the facts that everything points to the propagation of typhoid fever by dried fœces, and the high temperature existing in these underground places, it is manifest that there is a distinct risk of infection both to the other workmen and to the consumers of the bread. Such a risk can, indeed, never be entirely removed; but by the provision of separate and suitable accommodation, with adjoining lavatory basin, it may be reduced to a minimum. Closets, moreover, are never entirely free from offensive effluvia except when very thoroughly ventilated, and in cellars are particularly liable to be offensive, not to mention that the adequate ventilation of the closet and soil-pipe is practically never found. As regards a distinct water supply, that is in all cases provided for in Manchester. Generally the drainage opens in the cellar floor by a gully trap, an arrangement which, with adequate ventilation of the drain beyond the trap, with well-laid drains, and with sufficient supervision, need not in itself condemn the bakehouse. Unfortunately, these conditions are generally wanting.

In London the presence of drainage in the floor of the bakehouse renders it absolutely unfit for its purpose in those cases in which sewage backs up into the bakehouse, especially if it is remembered that bread is apt to be piled up on the floor and against the walls.

Generally, however, there are other conditions which, from a sanitary point of view, render cellar bakehouses unfit for use besides the presence of water-closets. Indeed, having regard to baking customs in Manchester, the absence of a closet in the cellar is even worse than its presence, since in many instances the unfortunate workmen are locked up all night, and if they have no closet are compelled to use the coal heap. It requires no imagination to realise what danger is involved in such a state of things.

To Dr. Waldo, I believe, is due the credit of having first used section 16 of the Act of 1883 to bring about the closing of cellar bakehouses. In prosecuting the occupiers of the bakehouses, he asked the magistrate not to make any order for alterations in certain instances—on the ground that the bakehouses could not be rendered fit for use—but simply to inflict a fine.

All that was then necessary was to repeat the prosecution in order to bring about the closing of the cellar. Cellar bakehouses in Manchester are mostly entered from the interior of the premises, and frequently communicate directly with the shop by a trap door. The ceiling is on a level with, or a little above or below, the surface of the adjoining street. The lighting is by means of small windows opening on an area beneath the adjoining pavement, of very limited extent, or else opening directly on the street without any area. The admission of fresh air is largely by means of these windows, and, as a consequence, when there is any wind blowing, a quantity of dirt and dust is admitted into the bakehouse. Frequently the amount of light admitted is insufficient to make any appreciable difference to the darkness of the cellar, and gas jets are kept constantly burning during working hours. The floors are irregular, and lodge dust. The walls and ceilings are broken and irregular, with the same result. As a rule, the walls are not visibly damp, owing to the high temperature maintained in the cellars; but occasionally they are not only damp, but offensive. The ceilings are often formed by joists and boards, and in those which I have seen the boards have been not infrequently cracked, allowing dirt to come through from the shop above. Most of the older cellars have a closet in or communicating with the cellar, and they almost always contain an entrance to a drain in the cellar floor. The proving troughs are placed against the walls, and both beneath these and under the tables, which cover a large miscellany of articles, dirt is apt to lodge. In fact in every way they are so constituted and arranged as to lead to the lodgment of dirt, and so dark as to lead both to the concealment of this and to the greatest possible detriment from it.

Whatever may be the apparent means of ventilation, as a matter of fact the atmosphere is generally stuffy, and perceptibly unwholesome and unrenewed. That this is so is proved by the circumstance (of which I am assured by a baker of large experience) that the hardening and cracking of the surface of dough, which is apt to occur after the loaves have been shaped if the dough is allowed to stand before being baked, occurs much less readily in a cellar bakehouse than in one which is above ground. The formation of this surface is no doubt due to the passage of air over the surface of the dough, causing rapid evaporation. This would be apt to occur more readily, one would think, in a cellar, owing to the high temperature, were it not for the comparative stagnation of the air, leading to the checking of evaporation.

The oven, which is at one end of the bakehouse—often the one most remote from the window—is mostly of the waggon type. The heating of the oven is effected by pushing into the oven "the waggon" charged with fuel and kindled, combustion being maintained by air admitted along a tube called the blower. The waggon has often to be renewed four or five times in a night, and for that purpose is dragged out into the bakehouse, giving off a copious supply of carbonic acid gas, carbon-monoxide, and sulphurous acid. So abundant is this discharge that it has even been made a subject of complaint by people living near these bakehouses. Carbonic acid gas is, of course, freely disengaged by the dough in the act of raising.

Then, again, the gas burned in these cellars, which are frequently small, still further adds to the gaseous impurities. According to Willoughby, a cubic foot of gas gives off in combustion 2 gr. of carbonic acid and ·2 to ·5 gr. of sulphurous acid, and therefore requires 1,800 cubic feet of air for proper dilution of its products. Ordinary burners consume 3 to 5 cubic feet of gas per hour, and hence require a supply of 5,000 to 9,000 cubic feet of air, or as much as two or three adult men. Increased space per head does not lessen the need for supply of fresh air, simply delaying the period when the limit of impurity is reached. A certain amount of carbonic acid is also contributed by the ground air. Thus the workman in these underground bakehouses respires an atmosphere comparatively poor in oxygen; or if, as may occasionally happen, the circulation of air is moderately good, to pay for the boon he is obliged to inhale a quantity of dust from the streets.

I have said that it is the custom to lock bakers up in these cellars all night, where they have to remain frequently in a most oppressive atmosphere, the temperature generally ranging from 72° to 88° F. They are thus compelled to remain for 12 hours at a stretch at an exhausting temperature, in a comparatively stagnant atmosphere, highly charged with moisture and with injurious gases, frequently inhaling street dust. We should expect under these circumstances that they would suffer much from chest disease. It is, however, difficult to get reliable statistics, since many leave the work as soon as possible, finding their health suffer; and others, more fortunate, who have escaped the consequences of their position and become master bakers, are no longer exposed to the risks of the business, but are enumerated among those on whom the mortality is calculated. Nevertheless, statistics obtained by Mr. S. N. Fox from the records of the Amalgamated Union of Operative Bakers and Confectioners, of which only 5 per cent. are confectioners, show that of deaths occurring among members of the Union from July, 1890, to July 1893, between the ages of 25–65, out of 131 deaths, phthisis caused 32 or 24·4 per cent., bronchitis and pneumonia 48 or 36·6 per cent. In the decade 1881–90, those diseases caused respectively 26·9 and 15·3 per cent. of the deaths of London males at those ages.

The excess of the mortality from lung diseases is particularly noticeable. As regards phthisis, bakehouses are but rarely crowded from the infective point of view, and inasmuch as infection is probably the most important factor in the causation of phthisis, we do not need to be surprised at these figures. Nor, probably, do the phthisis figures represent the real mortality in this class of workmen, for reasons already stated. But the indirect consequences of this exhausting occupation are, probably, not less serious than the direct. I am assured that a large number of bakers, feeling quite done up in the morning, go straight away for a drink, and it takes very little to make them intoxicated. In this way intoxication becomes a prevalent habit amongst them, and doubtless leads to many degenerations. In Dr. Ogle's figures of the comparative mortality of certain occupations, in the Supplement to the 45th Annual Report of the Registrar-General, bakers come third among suicides, and seventh among those who die of alcoholism. It is probable that their nervous system sustains severe injury, apart altogether from that inflicted by drinking.

"The lot of the journeyman baker," says Dr. Waldo, "is neither a healthy "nor an enviable one. From the nature of his occupation, he is placed in an "environment that saps his strength, and too often makes him prematurely "aged. His face is thin and pale, his shoulders are rounded, and his whole "look is suggestive of chronic ill-health.

"In consequence of the unhealthiness of the employment, the young "journeyman changes his occupation whenever he is able, and thus swells "the mortality figure of some other trade. His place is, however, quickly "filled up by a recruit from the country, or by an apprentice from Scotland or "the West of England.

"Again, among the diseases to which bakers are specially liable may be men-"tioned rheumatism, colds, erysipelas, and a form of eczema known as baker's "itch. They are peculiarly liable to rupture. Malgaigne, indeed, states that "their tendency to that affection is three times that of other trades. This "observation is readily accounted for by the fact that the baker has to lift "heavy sacks weighing 250 pounds. Another common affection of bakers is "flat foot, a deformity that produces a peculiar gait, and is also due to long "standing, to rheumatism, and to the habitual lifting of heavy weights.

"As to the hours of work (in London), from personal enquiries among the "journeymen, I find that seventy-two hours work weekly is a fair average in "the better-class trade, with Saturday evening and Sunday free.

"Nor is it easy to see how, with the present system of making bread by "hand, this time could be materially shortened. In the poorer neighbour-"hoods, where what is known as a 'cutting' business is conducted, the baker "works from eighty-four to a hundred hours weekly, and, in addition, "frequently bakes dinners up to half-past one o'clock on Sunday."

It is safe to say that such conditions of work must be extremely injurious to health.

But it is not merely the health of the journeymen bakers which is concerned, although as regards this large class of workmen it is difficult to see why they should be allowed to pass their nights shut up in cellars under such extremely unfavourable conditions, when people would not be allowed to occupy much superior cellars as dwellings. The condition of the bread is also a very important consideration, and although it may not be easy to connect bad health with the consumption of bread, it is safe to say that such a connection must occasionally exist. Dr. Waldo and Dr. Walsh have investigated the occurrence of bacteria in the centre of loaves after baking, and have shown that the presence of living bacteria can be demonstrated in them after baking the usual time, especially in the larger loaves. They have also shown that the temperatures attained in the centre of loaves, especially quartern loaves, is not sufficient to destroy all bacteria. Perhaps, however, even a greater danger arises to the loaves, after baking, from contact with damp and dirty walls, or from the deposit of dirt on them. On two occasions I have found bread quite damp. On one of these occasions the loaves were piled on the damp floor and against the damp walls of the bakehouse. On another occasion the bread was lying against the damp wall. It is difficult to believe other than that disease must be conveyed by bread so kept.

The prosecutions instituted by the St. George's Vestry began early in 1894, and in May the Sanitary Committee in Manchester gave instructions to the Medical Officer of Health to institute proceedings against a number of insanitary bakehouses.

The mode of proceeding was as follows :—

* The Medical Officer of Health, and subsequently the Workshops Inspector for the District, prepared a report of the condition of the worst cellar bakehouses, whereupon, after visiting, the Medical Officer of Health reported to the Sanitary Committee on the condition of the bakehouses. On his report that the bakehouse was unfit for use, the Committee gave instructions to institute proceedings. Such proceedings were at first taken, with two results, viz., that several bakehouses were closed, and the attention of the Manchester Bakers' Association was strongly directed to the question of cellar bakehouses. Subsequently the course of action was modified to this extent, that the occupiers of bakehouses were notified of the intention of the Committee to take proceedings unless satisfied that the bakehouses were made satisfactory to the Medical Officer of Health. This was found to act fairly well in practice, and to lead to nearly the same results as taking the bakers into Court.

The following list of cases dealt with from May, 1894, up to date, March 15th, 1895, gives the results of these proceedings. Before, however, giving this list it may be well to mention that the Bakers' Association of Manchester have arrived at a most important conclusion. Strongly exercised, at first, by the attack made on these bakehouses, they sent a deputation to the Medical Officer of Health to discuss the whole subject. In particular, the President of the Association (Mr. Hailwood), who from the first was anxious to arrive at a reasonable *modus vivendi*, after an intelligent and thorough examination of the question, came to the conclusion that the life of cellar bakehouses could only be very limited. Apparently he was able to carry the Association with him in this view, since on December 20th, 1894, they passed a resolution disapproving generally of cellar bakehouses. The resolution ran as follows :—

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* This preliminary visit was soon found to be unnecessary.

MANCHESTER AND DISTRICT MASTER BAKERS' ASSOCIATION.

> Resolved,—That this Association is willing to co-operate with the Manchester Corporation Sanitary Committee and the Medical Officer of Health for the City in their endeavour to improve the sanitary condition of the bakehouses, and this Association begs to record that it will favourably consider any proposed Act of Parliament that would gradually close all cellar bakehouses throughout the country, providing the reasonable interests of the trade are safeguarded.
>
> And further resolved,—That the above resolution be printed, and conveyed to the Lord Mayor, the Sanitary Committee of the Corporation, the Medical Officer of Health for the City, and the Members of this Association.
>
> I certify the above to be correct copies of the Resolutions recorded in Minutes of General Meeting held on Thursday, December 20th, 1894.
>
> *(Signed)* J. S. SYKES,
> *Secretary.*
>
> December 21st, 1894.

This resolution, however, it was well understood, was only with a view of expediting general legislation, since it is manifest that any action taken thereon over a limited area might have the effect of altogether driving baking out of the district, without doing away with baking in cellars. Nevertheless, considering that the bulk of baking is done in cellars, it shows much enterprise and courage to have openly avowed such an opinion.

From the subjoined list it will be seen that a considerable number of bakehouses have been dealt with :—

* LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR ROBERTS.

REMARKS.

1. Reported closed, August 24th, 1894.
2. Put in a satisfactory condition, July 26th, 1894.
3. Fined 20s. and 8s. 6d. costs, August 24th, 1894. Reported closed October 26th, 1894.
4. Allowed until July 2nd, 1895, to vacate premises. Closed.
5. Put in a satisfactory condition, December, 1894.
6. Summoned before Justices, November 23rd, 1894, and January 23rd, 1895. Proceedings withdrawn (satisfactory).
7. Medical Officer of Health reported to Committee as being in a satisfactory condition, July 23rd, 1894.
8. Work done satisfactory, February 12th, 1895.
9. Allowed until March 8th, 1895, to vacate premises. Closed.

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* These remarks only relate to bakehouses sufficiently bad to be unfit for use. The proceedings taken were conducted by the Assistant Solicitor, Mr. Miller. The ordinary work carried out in reference to bakehouses is summarised in a subsequent section by Mr. Rook.

LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR ROBERTS—*continued.*

REMARKS.

10. Allowed until April 30th, 1895, to vacate premises. Closed.
11. Allowed until March 30th, 1895, to vacate premises. Closed.
12. Alterations satisfactory.
13. Given the baker till April 5th to get specification of work in.
14. Notice served February 7th, 1895, to place bakehouse in a sanitary condition. Complied with.
15. Bakehouse entirely altered, properly lighted, and ventilated.
16. Allowed until September 30th, 1895, to vacate premises.
17. Allowed until September 30th, 1895, to vacate premises. Vacated.
18. Notice served February 7th, 1895, to place bakehouse in a sanitary condition.

LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR KEWLEY.

REMARKS.

19 In hands of Town Clerk, March 19th. Granted till September 30th, 1895, to clear out. Will build bakehouse.
20. Alterations in progress and almost completed, March 7th, 1895.
21. Vacated.
22. In hands of Medical Officer of Health. Necessary alterations will be carried out.
23. In hands of Medical Officer of Health. Have granted till July 1st to vacate. Vacated.
24. In hands of Medical Officer of Health. Notice of repairs to be given.

LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR THATCHER.

REMARKS.

25. Reported satisfactory, December 20th, 1893.
26. Reported closed, January, 1895. Fined 10s. and costs November 23rd, 1894.
27. In hands of Town Clerk.
28. Notice served to put same in a satisfactory condition, February 3rd, 1895. Work done.

LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR ROWE.

REMARKS.

29. Before Court August 24th, 1894. Alterations satisfactory, December, 1894.
30. Before Court August 24th, 1894; fined. Alterations satisfactory, November 9th, 1894.
31. Before Court August 24th ; not fined ; order made. Reported satisfactory, January 9th, 1895.
32. Medical Officer of Health reported not sufficient cause for closing, May 26th, 1894. Closet removed January 8th, 1895.
33. Not a cellar. Visited May 24th, 1894, and reported unfit. Reported satisfactory, November 9th, 1894.
34. Fined 20s. and 8s. 6d. costs, August 24th, 1894. Reported closed, September 17th. 1894.
35. Allowed until April 1st, 1895, to vacate premises by arrangement. Not vacated.
36. Allowed until April 1st, 1895, to complete repairs. Work done.
37. Work completed and now satisfactory, March 7th, 1895.

LIST OF BAKEHOUSES REFERRED TO MEDICAL OFFICER OF HEALTH BY INSPECTOR ROWE—*continued.*

REMARKS.

38. Alterations almost completed, March 7th, 1895.
39. In hands of Town Clerk. Has finally arranged to leave. Gave him to November 30th, 1895.
40. Reported closed, January 4th, 1895.
41. In hands of Town Clerk. Closed.
42. In hands of Town Clerk. Given to October 4th, 1895, to vacate.
43. In hands of Town Clerk. Given to September 30th, 1895, to vacate premises.
44. In hands of Town Clerk. Till April to consider what he will do.
45. In hands of Town Clerk. Have given the owner till March 27th to send specifications.
46. Notice served January 14th, 1895, to place same in a satisfactory condition. Work done.

Were it at all easy to obtain ground for building bakehouses on, it would be possible to proceed more rapidly in dealing with these places. In consequence, however, of the difficulty experienced in getting sites, it is necessary to allow a reasonable time before finally closing the present cellars, and (in the meantime) to restrict this proceeding to those which cannot be made reasonably sanitary by any means, and to those on which the landlord and tenant are not prepared to expend the sum required for that purpose. Inasmuch as there is a general similarity between all these places, one or two examples will suffice to indicate their character, and to illustrate the method of dealing with them.

Bakehouse No. 3.—Visited by Medical Officer of Health, May 8th, 1894. Report from the Workshops Inspector on August 10th, 1894, as follows :—

Sanitary Department,
August 10th, 1894.

Bakehouse No. 3.

EDWARD EVANS ROBERTS says :—I am an Inspector under the Workshops Acts.

Occupier.

I visited the bakehouse at 5, Bury New Road on the 30th July, 1894, and on previous occasions.

Owners.

The premises are owned by—

Cellar.

The bakehouse is in the basement, and the upper rooms are used as a shop and for living purposes.

Ceiling level.

The ceiling of the bakehouse is on a level with the footpath in front of the shop.

Height.

The height of the ceiling from the floor is 6 feet 10½ inches.

Capacity.

The cubical capacity is 2,104 feet.

Condition of walls, &c.

The walls, ceiling, floor, and steps are uneven and defective, causing dirt to lodge. Holes in the ceiling allow dust to come through from the shop above.

Fuel.

The fuel is stored in a brick compartment adjoining the bakehouse, which is not provided with a door.

The only means of obtaining daylight is by a window 3ft. by 1ft. 8in. at the front of the bakehouse, and below the level of the footpath, which, being insufficient, necessitates the use of gas when work is in progress. Light.

The only means of ventilation is by a hole in the wall at the back of the bakehouse 1ft. 3in. by 8in., a stone staircase leading to the ground floor, and a window at the front of the bakehouse 3ft. by 1ft. 8in., which, when open, admits dust and dirt from the street. This is inadequate for efficient ventilation, and I see no means of satisfactorily improving it. Ventilation.

The air of the bakehouse each time I visited it was exceedingly oppressive.

The place is swarming with crickets.

The bakehouse is approached by a stone staircase, leading from a passage at the back of the shop. Approach.

There were usually two or three persons working when I visited the place. Number of workpeople.

Date of establishment not known. Establishment

Proceedings were ordered by the Sanitary Committee, and the baker appeared in Court on August 24th, 1894, when he was fined 20s. and costs. The Medical Officer of Health declined to specify alterations, and the bakehouse was closed.

Bakehouse No. 1.—Visited and reported on by the Medical Officer of Health on May 8th, 1894. By the Workshops Inspector on July 30th, as follows:—

Sanitary Department,
August 10th, 1894.

Edward Evans Roberts says:—I am an Inspector under the Workshops Acts.

I visited the bakehouse at 74, Red Bank on the 30th July, 1894, and on previous occasions. Occupier.

The premises are owned by— Owner.

The bakehouse is in the basement, and the upper rooms are used for the purposes of a shop. Cellar.

The ceiling of the bakehouse is on a level with the footpath in front of the shop. Ceiling level.

The height of the ceiling from the floor is 7 feet 2 inches. Height.

The cubical capacity is 1,932 feet. Capacity.

The walls and floors are uneven and defective, causing dirt to lodge. Walls.

The fuel is stored in a recess under the footpath, which is open to the bakehouse, not being provided with a door. Fuel.

The only means of obtaining daylight is by two windows 2ft. by 1ft. 3in., each at the front of the bakehouse. Light.

Ventilation. The only means of ventilation is a door-way leading to the yard, which is very uneven and kept in a filthy condition, at the back of the bakehouse, and two windows 2ft. by 1ft. 3ins. each at the front of the bakehouse, which, when open, admit dust and dirt from the street and the chimney. This is inadequate for efficient ventilation.

Approach. The bakehouse is approached by a trap door in the floor of the shop, to which a ladder-like staircase is attached.

Drainage. There is a trapped inlet to a drain in the bakehouse. The premises and their surroundings are in a very dirty and dilapidated condition, and I see no means of satisfactorily improving them.

Establishment Date of establishment, 1888.

To this description may be added these notes, made on May 8th :—"The floor and wall adjoining the floor on one side are damp. Against this portion is a pile of loaves. There is a trap to the mouth of the drain in the bakehouse, under a rain-spout. The grid above this trap is badly set, and the adjoining ground is soaked, and smells. Outside the bakehouse the ground is wet and dirty."

Proceedings were taken against the occupant, who was summoned to appear in Court on August 24th, but the bakehouse was reported closed, and no further action was taken.

Bakehouse No. 31.—This cellar bakehouse is underneath the shop, from which it is reached by descending a staircase into the kitchen. After traversing the kitchen we reach the bakehouse, which is at the front of the building. On the staircase mentioned is a water-closet at the bottom of a long well, opening above on the roof. A ventilating shaft connected with the drain of the water-closet opens above into this space, and gases can be seen streaming from it. Passing into the bakehouse itself we find that it is small, the oven, which reaches nearly to the front wall, occupying a large portion of it, although between the back of the oven and the wall is a space into which dirt descends from the adjoining window. The atmosphere in this bakehouse is very warm and oppressive. It contains a water-closet, of which the soil pipe is unventilated. The floor and ceiling are so defective that they cannot be kept clean. There is no light, except gas light. Underneath the floor runs a culvert, in the neighbourhood of which rats are heard to run quite close to the floor.

The occupant was summoned to Court for August 24th, when the case was adjourned to give time to take advice as to what should be done, and was subsequently adjourned several times. A Sanitary Engineer was consulted, but, unfortunately, his advice was not taken. Ultimately, however, all the defects mentioned were remedied, and the bakehouse was allowed to pass on January 9th, 1895. The chief difficulty here was in regard to ventilation, and it was precisely here that the Engineer's advice was not taken. Two pipes were put in which acted, both of them, as extraction shafts, as from their position they were bound to do. But another large tube was carried from a height of 8 feet 6 inches above the ground, outside the bakehouse, and through the wall into the portion of the bakehouse most remote from the oven. The other two pipes being carried over the oven act as extractors. The windows are closed, and the circulation, which is perceptibly improved, is of comparatively pure air. The water-closet in the bakehouse has been removed, and the other conditions mentioned amended.

Bakehouse No. 6.—The following report was presented by the Inspector on November 20th, and the occupant was summoned to Court on November 23rd, 1894, and again on January 23rd, 1895:—

Sanitary Department,
20th November, 1894.

Edward Evans Roberts says:—I am an Inspector under the Workshops Acts.

I visited the bakehouse at 4, Butler Street on the 15th November, 1894, and on previous occasions. **Occupier.**

The premises are owned by— **Owner.**

The bakehouse is in the basement, and the upper rooms are used as a shop and for living purposes. **Cellar.**

The ceiling of the bakehouse is 9½ inches below the level of the footpath in front of the shop. **Ceiling level.**

The height of the ceiling from the floor is 7 feet 9 inches in the front portion of the bakehouse and 9 feet in the back portion of the bakehouse. **Height.**

The cubical capacity is— **Capacity.**

Front portion	2,612	feet.
Back ,,	2,092	,,
Total	4,704	,,

The ceiling, walls, and floor are in fairly good condition, there being only a few slight defects, which could easily be remedied. **Condition of walls, &c.**

The fuel is stored in a compartment adjoining the oven in the back portion of the bakehouse, which is not provided with a door. **Fuel.**

The only means of obtaining light is by a deck light 8ft. by 1ft. 5in. and by three windows 2ft. 2in. by 1ft. 1in. each. This appears to be sufficient for the front portion of the bakehouse, but the back portion is wholly without any means of obtaining light, and I can see no satisfactory means of remedying this defect. **Light.**

The only means of ventilation is by a winding staircase, which leads to the ground floor, and three windows 2ft. 6in. by 1ft. 9in. each, which are above the level of the footpath, but, when open, admit dust and dirt from the street. **Ventilation.**

Atmosphere. The air of the bakehouse (especially the back portion) each time I visited it was very oppressive.

Closet accommodation. There is a pail-closet in the yard at the back of the premises, which is fairly satisfactory; but there is also another one, which is used by the occupants of the premises adjoining (6, Butler Street), which is over one of the ovens.

Number of workpeople. There are three men employed in the bakehouse.

Approach. The bakehouse is approached by a wooden winding staircase, which leads from the shop on the ground floor.

Establishment Established 1880.

The summons mentioned above was withdrawn on sufficient improvement being shown in the condition of the bakehouse. When first seen, the back portion of this cellar was in almost total darkness. The front portion, abutting on Butler Street, was lighted by a window which also served as ventilator, admitting at the same time street dust. The oven was at the back of the cellar. This part of the bakehouse was situated beneath the shop, which was connected with it at the back by a staircase. Connected with the back portion of the cellar was a recess containing another oven, and used also for proving the dough. Three men were employed in this cellar, and had to work part of the time in this recess, which was unventilated, hot, and stifling. This recess stands below and behind a shop adjoining the baker's shop. In the yards behind, on either side of the oven on the ground level, was placed a pail privy, which was in both instances decidedly offensive.

Besides other improvements, the window in front was made fast, and altered so as to admit additional light. Air was not absolutely excluded, but street dust is no longer admitted. In the backyards, water-closets took the place of the offensive privies. An area window was let into the back part of the wall abutting on the yard, by which ample light and clean air were admitted into the back of the bakehouse. At the back of the recess a portion was cut out, so as to admit air and light. Air was also admitted into the recess by a large shaft opening above the adjoining shop, and carried down beneath it into the recess. Extraction shafts from the ceilings of both portions of the bakehouse led into a shaft carried along the wall of the oven, and then up above the roof at the back of the cellar. The bakehouse is now well lighted, clean, and quite fresh in all parts. In both these bakehouses the change in the atmosphere is felt by the workmen to be most agreeable.

These illustrations may serve to give an idea of the alterations which are, provisionally, accepted as sufficient.

In the little book published by Dr. Waldo and Dr. Walsh, the following conditions are laid down as necessary to make cellar bakehouses tolerable. As far as possible the other conditions are adhered to, but it is not possible to insist on the provision of areas round the cellars. The elementary conditions laid down are:—

1. The cellar must be sufficiently ventilated with clean air.
2. It must be lighted, if possible.
3. The surfaces must be even, and such as not to lead to the deposit of dirt.
4. They must be dry to the eye.
5. Street dust must be prevented from entering.
6. The internal arrangements must be such as not to induce harbourage of dirt, or to permit of fouling of the bread.
7. The surroundings must not be such as to expose the bakehouse to injurious effluvia, or to permit of pollution of the adjoining ground.
8. The drainage, if any, in the bakehouse must be sound.

It is in all cases intimated, where alterations are made, that the new condition of things must be understood to be temporary, and that the aim of the Corporation is to bring about the abolition of cellar bakehouses.

OUTLINE OF WORK DONE BY THE SANITARY DEPARTMENT IN THE YEAR 1894.

Sanitary Department,
Town Hall, Manchester,
June, 1895.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1894, I beg to state that the City, for inspection and other purposes, has been divided into 28 districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there are also four Smoke, one Canal Boats, two Adulteration of Food, and four Factory and Workshops Inspectors.

The number of complaints of nuisances of various kinds made during the year was 51,870, viz. :—

1,981	through the Medical Officer of Health's Department.
1,959	by the Public
4,257	through the Police
43,673	by the Staff.

The number of inspections and re-inspections was as follows* :—

36,219	Dwelling-houses
3,165	Inspections and
10,228	Re-inspections of infected dwelling-houses.
55	Factories and Workshops
539	Cellars
584	Offensive trades
189	Slaughter-houses
138	Schools
1,933	Mills
405	Tips
11,162	Miscellaneous.

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* See also table for the year ending December 31st, 1894 (page 165), relating to nuisances.

For the abatement of nuisances of various kinds, 15,268 notices were served, viz.:—

To abate overcrowding	259
To cleanse and limewash houses	1,277
To cleanse privies	452
To cleanse bakehouses	19
To cleanse workshops	193
To discontinue nuisances arising from black smoke being emitted from chimneys	104
To repair, &c., house drains	4,866
To register houses occupied by lodgers	565
To remove offensive deposits, stagnant water, &c.	737
To abate nuisances arising from animals kept in a filthy state, or to remove such animals	128
To repair, cleanse, &c., privies, ashpits, water-closets	1,336
To provide water-closets	39
To repair yards and passages	556
To repair dilapidated houses	2,454
To cleanse and disinfect dilapidated houses	2,115
To provide urinals to public and beer houses	6
To close houses in a dilapidated, &c., condition, and consequently unfit for human habitation	118
To place bakehouses in a proper sanitary condition	7
To place workshops in a proper sanitary condition	37

33,666 re-inspections have been made after notices to ascertain if the work had been done.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the bye-laws made thereunder have been strictly enforced.

The number of houses on the register is 1,526.

To these, 1,618 day visits and 456 night visits have been paid.

65 infringements of the regulations have been reported and dealt with.

104 night visits have also been paid to unregistered houses, the occupiers having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, 2,354 milkshops and dairies and 127 cowkeepers have been placed on the register.

The number of cows kept in the City is 1,606, and the number of visits paid was 4,557, which resulted in only one offence being reported against the regulations.

It may be stated that many of the dairies and cowsheds are not in a very satisfactory condition, and great reluctance has been shown in the past in consequence of the very serious structural alterations required to enforce the alterations necessary to bring them up to the present state of sanitary requirements.

The regulations made so long ago as 1879 require amending, and when this takes place powers should, if possible, be obtained to refuse registration in all cases where the dairies and milkshops are not suitable for the business or the cowsheds are structurally unfit.

WORKSHOPS, BAKEHOUSES, AND SHOP HOURS ACTS.

On the 29th August, 1893, the Sanitary Committee appointed two Inspectors to carry out the Workshops and Shop Hours Acts; and on the 10th October following, two female Inspectors were also appointed for the same purpose. The female Inspectors confine their attention to workshops where females are employed, to shops where young persons are employed, and to visiting shops where outworkers are employed. In respect of the latter, a list of outworkers is kept, and visits are paid to the houses in which the work is being done.

Two other male Inspectors have since been appointed; the City, for inspection purposes, being divided into four districts—the two female Inspectors visiting any of the districts as required.

The inspections by these Officers have already resulted in a marked improvement in the condition of the workshops and bakehouses, and the figures hereafter given do not at all represent the actual work done, as many of the occupiers have, at the request of the Inspectors, without notice, made alterations for improving the ventilation, lighting, and cleansing, &c.

As regards the Shop Hours Act, there is every reason to believe that, with few exceptions, the Act is now being fairly well observed.

The work done by these Officers under the above Acts is shown by the tables on pages 140 and 141.

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 1,782 timed observations of half-an-hour each, with the result that 104 notices for the abatement of nuisances have been served. In addition to which, proceedings before the magistrates have been ordered in 136 cases out of 214 offences reported. These cases were disposed of as follows:—

136 were summoned before the Justices, in 66 of which fines were imposed amounting to £119 19s. 6d., and costs £29 1s.

2 were ordered to pay costs only.

47 Orders of Abatement were granted and served, and 21 cases were excused, dismissed, or withdrawn.

FOOD AND DRUGS ACT AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,644 samples. Of these, 108 only were adulterated, viz.:—

Butter	27
Milk	60
Mineral Waters	8
Mustard	3
Spirits	2
Vinegar...	8

100 summonses were issued. In 68 cases fines were imposed, amounting in the aggregate to £139 1s., with costs £110 19s. 4d.

26 summonses were dismissed or withdrawn.

6 were ordered to pay costs only.

The samples of mineral waters were certified to contain small traces of lead and the manufacturers in each case were communicated with, and steps taken by them to prevent a recurrence of the contamination.

CANAL BOATS ACTS.

The number of canal boats on the register is 645.

The number inspected was 2,064, resulting in 18 infringements of the Act being discovered, which were referred to the Justices to be dealt with: 13 being fined, the fines amounting in the aggregate to £1 19s. 6d., with £5 2s. costs.

2 were ordered to pay costs only.

1 was dismissed.

2 summonses were withdrawn, and 211 caution notices were sent to the owners and masters.

WORK DONE BY THE INSPECTORS UNDER THE ACTS FROM THE 18TH SEPTEMBER, 1893, TO 19TH SEPTEMBER, 1894.

INSPECTOR	SHOPS				WORKSHOPS						Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES			
	Number visited	Number of copies of Abstract of Act distributed	Number of infringements of Act reported	Total number on register	Number visited	Number of Lists of Outworkers and Contractors distributed	Number of premises in which the Sanitary Arrangements were found defective	Number of reports referred to Factory Inspector (unregistered factories, &c.)	Total number on register	Number of visits to houses where Outworkers are Employed		Number visited	Number of premises in which the Sanitary Arrangements were found defective	Number of reports referred to Factory Inspector	Total number on register
Edward E. Roberts	1,362	528	56	520	3,392	257	555	214	1,326	...	9	418	125	10	195
Francis J. Rowe	2,909	960	51	951	2,695	251	360	62	1,177	...	3	382	97	...	187
Emma Coppock	3,337	480	11	473	623	22	28	66	...	457	...	...	...	...	...
Alice Tattersall...	2,762	315	7	314	849	29	29	67	...	931	...	...	...	...	...
TOTALS	10,370	2,283	125 *	2,258	7,559	559	972 †	409	2,503	1,388	12 ‡	800	222 §	10	382

* In the whole of the 125 cases reported for infringements of the Shop Hours Act, the persons are now complying with the Act.

† Of the 972 Sanitary defects reported in Workshops, 141 have been referred to the City Surveyor to prepare plans for improved closet accommodation, in 26 of which cases the necessary accommodation has been provided; 780 have been remedied, and 51 not remedied (44 notices have been served and 7 occupiers have promised to make good the defects).

‡ Of the 12 cases of Factories or Workshops reported for being insufficiently supplied with means of escape in case of fire, 10 notices have been served, and 2 referred to the City Surveyor for report thereon.

§ Of the 222 defects in Bakehouses, 1 has been referred to the City Surveyor to prepare plan for improved closet accommodation, 191 have been remedied, and 30 not remedied (in 12 of the cases the Medical Officer of Health has reported the premises unfit for use, and the reports were referred to the Town Clerk to take proceedings for closing the same, in 7 of which cases proceedings have been taken, particulars of which are given in the following table; and in 18 cases the occupiers have promised to make good the defects reported).

Prosecutions for Offences, with Results.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid		
			£	s.	d.	£	s.	d.
R. H. Hales	126, Oldham Road, Newton Heath ...	Employing a young person over 74 hours per week	0	10	0	0	11	0
T. Pickin	83, Bridge Street	Not exhibiting Abstract in a conspicuous position in shop	0	1	0	0	2	6
W. F. Antrobus ...	85, Lower Moss Lane	Ditto ditto	0	5	0	0	5	0
Robert Pritchard ...	13, New Brown Street	Neglecting to cleanse, &c., workshop after notice	0	10	0	0	8	6
Alfred Mitchell......	82, Portland Street	Neglecting to ventilate his workshop after notice	Withdrawn			(work done)		
Joseph Copeland ...	4a, Pimblett Street	Having his bakehouse in a dirty condition	0	10	6	0	8	6
Charles D. Megson..	64, Pollard Street	Ditto ditto ...	Withdrawn			(work done)		
Jacob Barker	2a, Scotland	Ditto ditto ...	0	10	6	0	8	6
Samuel Shirley	6, Marcer Street	Ditto ditto ...	Withdrawn			0	3	0
Thomas Condron ...	80, Warde Street, Hulme	Occupying premises certified by the Medical Officer of Health to be unfit for use as a Bakehouse on sanitary grounds	1	0	0	0	8	6
Wm. Wenfield	74, Red Bank	Ditto ditto ...	Withdrawn			(Removed)		
Mendel Horwitz ...	5, Bury New Road	Ditto ditto ...	1	0	0	0	8	6
Wm. G. Maclurkin..	63, Princess Street	Ditto ditto	Pending					
George Wm. Turner	122, Medlock Street........................	Ditto ditio						
John Greenwood ...	1, Ludlow Street, Chorlton-on-Medlock	Ditto ditto						
David Williams......	2, Hampden Place, Hulme..............	Ditto ditto						
		Total.........£	4	7	0	3	4	0

OFFENSIVE TRADES.

The number of offensive trades on the register is 275. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 828 houses were certified to be dealt with by the Sanitary Committee.

793 of these were ordered to be closed.

A large proportion of these houses have since had structural alterations made to them which satisfied the requirements of the Medical Officer of Health, and have since been allowed to be reinhabited.

CLOSET ACCOMMODATION TO WORKSHOPS, WAREHOUSES, &c.

133 properties were reported as being deficient in closet accommodation.

In a large number of cases the necessary accommodation has been provided, and in others orders have been made to provide the necessary accommodation, or the reports are under consideration.

I am unable to conclude this report without calling attention to the very serious danger to health arising from the present pail-closet system. In hundreds of the narrow back passages in the City the air at any time, and especially on a close warm day, is most sickening; and as most of the closets are within a few feet only of the back doors, or underneath the windows, the air must of necessity be drawn into the houses. The sooner a change is made and the water-carriage system adopted the better it will be, in my opinion, for the health of the citizens.

A. T. Rook,
Superintendent.

PARTICULARS RELATING TO THE OPERATIONS OF THE CLEANSING COMMITTEE.

Cleansing Department,
Town Hall, Manchester,
June 21st, 1895.

Dear Sir,—In response to your request, I now have pleasure in giving you the following information. There are within the City, pail-closets, 78,486; midden privies, 23,176; wet middens, 12,525; dry middens, 743; water-closets, 24,300; and cesspools, 107. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The privies are emptied as required. Within the last six months, arrangements have been made for systematic and regular emptying of all privies and middens. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fœcal matter is dried into Concentrated Manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the place. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Bridge. The privy refuse and fœcal matter which is taken to Water Street is sent away in its crude state as nightsoil to Carrington Moss and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fœcal matter from the pail-closets. The market garbage, of which we have about 4,000 tons per annum, is carted to Water Street, and there loaded into boats and sent away to Carrington Moss immediately. Slaughter-house refuse is collected from the Abattoirs and private slaughter-houses and sent to Holt Town, where it is passed through dryers, and evaporated to dryness; the dry material is then added to our Concentrated Manure. Street sweepings are generally deposited at the nearest depot, and there allowed to drain; the dry sweepings are then carted to the nearest tip. We have within the City over 60 destructor furnaces of different kinds, and you will find in the Municipal Code, page 590, which has recently been prepared by Mr. Hudson, a statement showing the position and area of our various tips within the City, to which all dry and inoffensive matter which is not dealt with at Water Street or Holt Town is sent. Last year we made close upon 20,000 tons of mortar from the clinker which we obtained from the destructor furnaces. We now employ nearly 100 "orderly" boys: they collect horse droppings and litter from the street, and deposit the same in the bins which are fixed in the footpaths. The contents of the bins are removed daily, and taken to the nearest depot. With regard to the removal of the contents of the pails from typhoid fever cases: Acting upon instructions we received from you, special pails and lids are supplied for all cases of enteric fever: labels are attached to the pails, asking the occupants to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not fixed in the ashplace. The occupants are requested to use this special pail for the reception of the fœcal matter and washings from the patient only. The pails are removed periodically in a specially-constructed vehicle, and taken to Holt Town depot, where the contents are destroyed. With regard to the cleansing of passages, we have a staff of about 50 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 423,077 swillings and cleansings were effected in courts and passages. A great improvement in the condition of a number of closets and passages has been effected during the past year in consequence of new urine-guides having been fixed to the closets referred to, thus preventing the liquid from running into the ashplace, and at times into the passage, not only saturating the floor and foundation of the ashplaces and closets with filth, but at times even flowing into the passages. As you are aware, there remains much to be remedied in this respect. We have, however, specially engaged men, who are repairing and refixing urine-guides as quickly as they can do so.

During the last three years we have deposited upon the various tips within the City the following quantities of material, viz.:—In 1892, 99,866 tons; 1893, 109,078 tons; and in 1894, 103,949 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During the last year no less a quantity than 68,000 tons of material was sent to Carrington. Immediately we commence to send refuse to Chat Moss, Carrington will, of course, be relieved of at least three-fourths of that quantity. 20,000 tons per annum would be ample to supply the requirements of all the land at Carrington. Chat Moss is capable of receiving all the material we shall have to dispose of for many years to come.

Yours faithfully,
R. D. Callison,
Indoor Superintendent.

Dr. Niven,
Medical Officer of Health,
Town Hall, Manchester.

TABLES.

TABLE A.—MANCHESTER, 1894.

CAUSES OF DEATH AT DIFFERENT LIFE PERIODS IN THE 52 WEEKS OF THE YEAR.

PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
All Causes	10355	2633	1617	287	161	221	256	726	977	1018	1067	948	395	49
I. ZYMOTIC DISEASES	1,472	488	603	89	26	31	22	61	47	21	41	31	12	...
II. PARASITIC DISEASES	4	4	...	...	...	...	...	...	...	..	...	..	...	...
III. DIETETIC DISEASES	64	3	1	...	...	...	...	10	19	13	13	5	...	...
IV. CONSTITUTIONAL DIS:	1,980	197	205	63	46	96	109	314	358	281	190	107	14	...
V. DEVELOPMENTAL DIS:	506	285	2	...	1	...	...	...	...	2	10	79	101	26
VI. LOCAL DISEASES	5,151	1030	677	98	76	83	113	304	499	619	738	653	242	19
VII. VIOLENCE	393	88	60	33	11	11	9	27	37	43	36	30	7	1
VIII. ILL-DEFINED CAUSES	785	538	69	4	1	...	3	10	17	39	39	43	19	3
I.—*Zymotic Diseases.*														
1. MIASMATIC DISEASES.														
Smallpox.. Vaccinated	8	...	...	...	...	...	...	2	5	1	...	...	...	...
Smallpox.. Unvaccinated	8	...	2	3	1	1	...	1	...	...	...	...	...	...
Smallpox.. No Statement	5	1	...	...	...	...	1	1	1	1	...	...	...	...
Chickenpox	5	3	2	...	...	...	...	...	...	...	...	...	...	..
Measles	222	45	162	13	1	...	1	...	...	...	...	...	...	...
Epidemic Rose Rash	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever..	116	12	71	25	3	3	1	...	1	...	...	...	...	...
Typhus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	45	3	2	...	...	4	3	6	5	5	11	4	2	...
Whooping Cough	286	108	169	9	...	...	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria	102	8	63	23	6	...	...	2	...	...	...	...	...	...
Membranous Croup	47	4	39	3	1	...	...	...	...	...	...	...	...	...
Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple and Ill-defined Fever	5	1	...	...	1	1	...	2	...	...	...	...	...	...
Enteric Fever	91	...	2	7	13	18	7	22	10	4	8	...	...	...
Other Miasmatic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. DIARRHŒAL DISEASES.														
Simple Cholera	10	4	1	1	...	...	...	1	1	...	1	1	...	...
Diarrhœa, Dysentery	365	226	83	5	...	1	...	3	3	4	15	19	6	...
3. MALARIAL DISEASES.														
Remittent Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ague	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4. ZOOGENOUS DISEASES.														
Hydrophobia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Splenic Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox and other effects of Vac:	1	1	...	...	...	...	...	...	...	...	...	...	...	...
5. VENEREAL DISEASES.														
Syphilis	68	62	6	...	...	...	...	...	...	...	...	...	...	...
Gonorrhœa, Stricture of Urethra	14	...	...	...	...	...	...	1	4	3	3	1	2	...
6. SEPTIC DISEASES.														
Phagedæna	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Erysipelas	23	3	1	...	...	3	...	3	3	2	2	4	2	...
Pyæmia, Septicæmia	18	7	...	...	...	...	1	3	4	...	1	2	...	...
Puerperal Fever	32	...	...	...	...	...	8	14	9	1	...	...	...	...
II.—Parasitic Diseases.														
Thrush	4	4	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: from Veg: Parasites	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydatid Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: from Animal Par:	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1894—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
III.—Dietetic Diseases.														
Starvation, Want of Breast Milk	6	3	1	...	...	...	...	...	...	...	1	1	...	...
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intem: Chronic Alcoholism	50	...	...	...	...	...	...	10	16	11	11	2	...	...
Intem: Delirium Tremens	8	...	...	...	...	...	...	...	3	2	1	2	...	...
IV.—Constitutional Diseases.														
Rheum: Fev: Rheum: of Heart	43	1	1	4	8	7	4	9	5	3	1	...	...	...
Rheumatism	30	...	...	...	2	1	...	1	4	3	7	11	1	...
Gout	3	...	...	...	...	...	...	...	1	...	2	...	...	...
Rickets	33	9	24	...	...	...	...	...	...	...	...	...	...	...
Cancer	344	1	1	2	2	...	1	11	52	103	94	67	10	...
Tabes Mesenterica	94	64	24	3	3	...	...	...	...	...	...	...	...	...
Tuberc: Mening: (Hydroceph:)	172	59	75	17	8	6	3	1	3	...	...	...	...	...
Phthisis	1,026	3	11	21	16	75	90	277	275	165	73	19	1	...
Other forms of Tuberc: Scrofula	179	57	64	15	6	3	8	10	9	2	4	1	...	...
Purpura, Hæmorrhagic Diathesis	7	2	2	...	...	...	...	...	1	...	1	...	1	...
Anæmia, Chlorosis, Leucocy:	18	1	3	1	1	3	2	2	1	2	1	1	...	...
Diabetes Mellitus	31	...	...	...	...	1	1	3	7	3	7	8	1	...
Other Constitutional Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
V.—Developmental Diseases.														
Premature Birth	232	232	...	...	...	...	...	...	...	...	...	...	...	...
Atelectasis	5	5	...	...	...	...	...	...	...	...	...	...	...	...
Cyanosis	24	22	1	...	1	...	...	...	...	...	...	...	...	...
Spina Bifida	9	9	...	...	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	5	5	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate Harelip	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	12	11	1	...	...	...	...	...	...	...	...	...	...	...
Old Age	218	...	...	...	...	...	...	...	...	2	10	79	101	26
VI.—Local Diseases.														
1.—Nervous System (Dis: of).														
Inflam: of Brain or its Mem:	166	51	66	12	4	5	2	5	13	4	2	2	...	...
Apoplexy	255	2	...	...	1	2	...	11	22	51	72	71	23	...
Softening of the Brain	32	...	...	...	...	...	1	...	2	6	8	10	5	...
Hemiplegia, Brain Paralysis	118	...	2	...	...	2	...	3	3	17	33	48	8	2
Paralysis Agitans	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Insanity, Gen: Par: of Insane	120	...	...	...	...	...	4	14	20	32	26	16	8	...
Chorea	2	...	...	...	1	...	...	...	...	...	...	...	1	...
Epilepsy	41	...	1	...	5	1	2	6	12	9	2	3	...	...
Convulsions	293	230	56	5	1	...	...	...	...	...	...	1	...	...
Laryngismus Stridulus	10	8	2	...	...	...	...	...	...	...	...	...	...	...
Idiopathic Tetanus	2	1	1	...	...	...	...	...	...	...	...	...	...	...
Paraplegia, Dis: of Spinal Cord	37	2	2	1	...	1	1	...	6	3	10	8	3	...
Other Diseases of Nervous Sys:	65	7	9	...	4	3	3	6	11	8	8	3	3	...
2. Organs of Special Sense (Diseases of).														
Otitis, Otorrhœa	14	2	5	1	...	2	2	2	...	...	...	...	...	...
Epistaxis and Disease of Nose	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ophthalmia and Disease of Eye.	3	2	...	...	...	...	...	...	...	1	...	...	...	...
3. Circulatory Sys: (Dis: of)														
Endocarditis	21	...	1	2	4	...	3	1	3	2	5	...	...	...
Valvular Disease	155	1	...	3	8	7	3	18	45	25	20	18	6	1
Pericarditis	14	...	1	1	2	3	...	2	2	2	...	1	...	...
Hypertrophy of Heart	3	...	...	...	...	...	...	1	...	...	...	2	...	...
Angina Pectoris	8	...	...	...	...	...	...	...	...	5	1	...	2	...
Syncope	42	6	...	...	...	1	...	...	4	3	7	12	9	...

TABLE A, 1894—*continued.*

CAUSES OF DEATH	AGES AT DEATH												
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
3. CIRCULATORY SYS: (DIS: OF) *(continued)*														
Aneurism	21	...	...	...	...	...	...	3	7	9	2	...	...	...
Senile Gangrene	19	...	...	...	...	...	...	...	...	...	5	6	7	1
Embolism, Thrombosis	29	...	...	...	1	2	1	7	2	4	5	7	...	...
Phlebitis	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Varicose Veins	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Other Dis : of Circulatory Sys :	513	7	...	2	4	11	15	34	71	88	144	105	31	1
4. RESPIRATORY SYS: (DIS: OF)														
Laryngitis	27	6	15	1	...	...	...	1	1	...	2	1	...	...
Croup	31	3	22	6	...	...	...	...	...	...	...	...	...	...
OtherDis:of Larynx and Trachea	3	...	1	1	...	...	...	1	...	...	...	...	...	...
Emphysema, Asthma	17	1	1	...	...	...	1	1	4	2	4	2	1	...
Bronchitis	1,043	275	138	7	1	2	3	23	57	106	160	180	81	10
Pneumonia	1,035	237	277	34	17	15	32	69	90	106	86	49	23	...
Pleurisy	28	2	5	...	...	1	3	4	2	8	2	1	...	...
Other Dis: of Resp: System	87	22	9	1	1	...	2	8	9	11	10	10	3	1
5. DIGESTIVE SYS: (DIS: OF).														
Stomatitis	17	11	2	2	1	...	...	...	...	...	1	...	...	...
Dentition	21	19	2	...	...	...	...	...	...	...	...	...	...	...
Sore-throat, Quinsy	2	...	...	...	...	1	...	1	...	...	...	...	...	...
Dyspepsia	14	5	1	...	...	...	1	...	1	3	1	1	1	...
Hæmatemesis	6	...	...	...	1	...	...	1	1	2	1	...	...	...
Melæna	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of Stomach	71	25	8	2	...	...	1	5	8	6	4	10	2	...
Enteritis	105	61	17	2	1	1	...	3	4	6	4	2	4	...
Ulceration of Intestine	7	...	...	...	...	2	1	1	1	1	...	1	...	...
Ileus, Obstruction of Intestine..	35	5	2	...	1	2	1	2	3	6	6	7	...	...
Strict: or Strang: of Intestine...	4	...	...	2	...	...	...	...	...	...	1	1	...	...
Intussusception of Intestine	8	4	2	...	...	1	...	1	...	...	...	...	...	...
Hernia	17	...	...	1	...	1	...	...	2	2	5	4	2	...
Fistula	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Peritonitis	60	3	3	1	3	5	8	10	9	7	4	6	1	...
Ascites	5	1	...	...	...	...	...	...	...	1	...	1	2	...
Gallstones	3	...	...	...	...	...	...	...	1	...	1	...	1	...
Cirrhosis of Liver	56	...	...	...	...	...	...	2	11	18	17	7	1	...
Other Diseases of Liver	47	10	2	...	...	1	2	4	6	5	13	3	1	...
Other Dis: of Digestive System	21	9	1	2	...	...	1	2	1	1	3	1	...	...
6. LYMPH: SYS: AND DUCTLESS GLANDS (DIS: OF).														
Diseases of Lymphatic System.	6	1	2	...	2	...	...	...	...	1	...	...	...	...
Diseases of Spleen	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Bronchocele	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Addison's Disease	2	...	...	...	...	...	...	...	1	1	...	...	...	...
7. URINARY SYSTEM (DIS: OF).														
Acute Nephritis	53	3	10	3	4	1	4	4	10	6	6	1	1	...
Bright's Disease	141	1	1	2	2	3	5	16	21	29	27	29	4	1
Uræmia	12	...	1	...	...	...	...	2	1	3	2	3	...	...
Suppression of Urine	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Calculus	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Hæmaturia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dis: of Bladder and Prostate	28	...	...	...	...	...	...	1	3	3	6	9	4	2
Other Dis: of Urinary System..	18	2	...	1	...	2	...	...	2	4	6	1	...	...
8. REPRODUCTIVE SYSTEM (DISEASES OF).														
(a) Generative Organs (Dis: of):														
Ovarian Disease	4	...	...	...	...	...	...	...	1	1	2	...	...	...
Diseases of Uterus and Vagina.	11	...	1	...	...	...	...	3	4	3	...	...	...	...
Disorders of Menstruation	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1894—*concluded.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
8. Reproductive System (Dis: of)—*continued.*														
Pelvic Abscess	2	...	...	...	...	...	1	...	...	1	...	...	...	...
Perineal Abscess	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Dis: of Testes, Penis, Scrotum, &c.	1	...	...	...	...	...	...	...	...	1	...	...	...	...
(b) Parturition, Disease of:														
Abortion, Miscarriage	3	...	...	...	...	...	...	2	1	...	...	...	...	...
Puerperal Mania	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Puerperal Convulsions	5	...	...	...	...	...	2	3	...	...	...	...	...	...
Placenta Prævia, Flooding	22	...	...	...	...	...	1	8	13	...	...	...	...	...
Phlegmasia Dolens	2	...	...	...	...	...	...	1	1	...	...	...	...	...
Other Accidents of Childbirth	13	...	...	...	...	...	3	8	2	...	...	...	...	...
9. Locomotor Sys: (Dis. of).														
Caries, Necrosis	15	...	2	...	3	3	2	1	2	...	1	1	...	...
Arthritis, Ostitis, Periostitis	7	1	...	1	1	...	...	...	...	...	2	2	...	...
Other Dis: of Locom: Sys:	16	...	2	2	3	2	2	...	1	1	2	1	...	...
10. Integumentary System (Diseases of).														
Carbuncle	4	...	...	...	...	...	...	...	...	...	3	1	...	...
Phlegmon, Cellulitis	8	2	1	...	...	...	...	1	2	1	...	1	...	...
Lupus	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Ulcer, Bedsore	11	1	1	...	...	...	...	...	...	1	4	2	2	...
Eczema	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Pemphigus	2	1	...	...	...	...	...	...	...	...	1	...	...	...
Other Dis: of Integ: Sys:	...	...	...	...	...	...	...	...	...	...	...	...	...	...
VII.—Violence.														
1. Accident or Negligence.														
Fractures, Contusions	130	4	12	5	9	4	6	11	20	15	18	18	7	1
Gunshot Wounds	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Cut, Stab	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Burn, Scald	75	2	38	22	...	...	1	1	1	6	2	2	...	...
Poison	16	1	1	...	...	2	...	2	...	4	4	2	...	...
Drowning	27	...	5	5	2	2	...	1	2	6	3	1	...	...
Suffocation	85	77	3	...	...	...	...	4	...	1	...	...	...	...
Otherwise	8	2	1	1	...	...	...	1	...	1	2	...	...	...
2. Homicide.														
Murder, Manslaughter	6	2	...	...	...	...	...	1	1	1	1	...	...	...
3. Suicide.														
Gunshot Wounds	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Cut, Stab	10	...	...	...	...	...	1	2	4	...	2	1	...	...
Poison	14	...	...	...	...	2	1	3	3	4	1	...	...	...
Drowning	2	...	...	...	...	...	...	...	1	...	...	1	...	...
Hanging	14	...	...	...	...	...	...	1	2	5	1	5	...	...
Otherwise	2	...	...	...	...	...	...	...	2	...	...	...	...	...
VIII.—Ill-defined and not Specified Causes.														
Dropsy	5	1	...	...	...	...	...	...	...	1	2	1	...	...
Debility, Atrophy, Inanition	533	449	49	2	...	...	...	...	...	...	4	16	10	3
Mortification	2	...	...	...	...	...	...	...	...	1	...	1	...	...
Tumour	2	1	...	...	...	...	...	...	...	...	1	...	...	...
Abscess	8	3	3	...	...	...	1	...	1	...	...	...	...	...
Hæmorrhage	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Sudden (cause unascertained)	148	48	16	2	...	...	1	9	12	26	15	13	6	...
Other Ill-def: not spec: causes.	86	35	1	...	1	...	1	1	4	11	17	12	3	...

TABLE B.

Summary of Table A, compared with Average Deaths in Groups of Diseases, 1891–93.

	Deaths	
	1894	Average 1891-93
I.—Specific Febrile, or Zymotic Diseases:		
1. Miasmatic Diseases	940	1,324
2. Diarrhœal ,,	375	602
3. Malarial ,,	...	...
4. Zoogenous ,,	1	2
5. Venereal ,,	82	68
6. Septic ,,	74	103
II.—Parasitic Diseases	4	8
III.—Dietetic Diseases	64	72
IV.—Constitutional Diseases	1,980	2,050
V.—Developmental Diseases	506	659
VI.—Local Diseases:		
1. Diseases of Nervous System	1,142	1,375
2. Diseases of Organs of Special Sense	17	19
3. Diseases of Circulatory System	827	923
4. Diseases of Respiratory System	2,271	3,033
5. Diseases of Digestive System	500	577
6. Diseases of Lymphatic System and Ductless Glands	10	11
7. Diseases of Urinary System	254	276
8. Diseases of Reproductive System:		
(a) Diseases of Generative Organs	19	32
(b) Diseases of Parturition	46	72
9. Diseases of Locomotor System	38	50
10. Diseases of Integumentary System	27	22
VII.—Violence:		
1. Accident or Negligence	344	355
2. Homicide	6	8
3. Suicide	43	33
VIII.—Ill-defined and not Specified Causes	785	877
Total	10,355	12,551

TABLE C.—MANCHESTER, 1894.

Causes of Deaths at different Life Periods—MALES.

Classes	CAUSES OF DEATH	All Ages	Ages at Death—in years												
			Under 5 Years												
		Total	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	5296	1428	821	145	86	120	129	366	494	556	536	431	164	20
I.	Smallpox	15	1	1	2	1	...	1	4	3	2	...	...	...	...
	Measles	122	26	90	5	1	...	...	...	...	...	...	...	...	...
	Scarlet Fever	50	3	29	15	1	1	1	...	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	125	49	71	5	...	...	...	...	...	...	...	...	...	...
	Diphtheria	47	5	28	10	3	...	...	1	...	...	...	...	...	...
	Membranous Croup	24	4	19	...	1	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	3	1	...	...	...	...	...	2	...	...	...	...	...	...
	Enteric Fever	56	...	1	4	5	14	6	10	6	2	8	...	...	...
	Influenza	20	2	1	...	...	3	...	2	2	3	5	2	...	...
	Simple Cholera	6	3	...	...	...	...	...	1	1	...	...	1	...	...
	Diarrhœa, Dysentery	184	114	47	2	...	...	...	1	1	2	8	8	1	...
	Venereal Affections	45	29	2	...	...	...	...	1	4	3	3	1	2	...
	Erysipelas	9	...	...	...	...	2	...	2	2	1	...	2	...	...
	Pyæmia	6	2	...	...	...	...	1	...	2	...	...	1	...	...
	Puerperal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	5	4	1	...	...	...	...	...	...	...	...	...	...	...
II.	Parasitic Diseases	2	2	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	41	2	1	...	...	...	...	6	12	9	8	3	...	...
IV.	Rheumatic Fever	18	1	...	1	5	3	1	4	2	...	1	...	...	...
	Rickets	23	6	17	...	...	...	...	...	...	...	...	...	...	...
	Cancer	124	...	1	2	...	...	...	...	14	39	33	29	6	...
	Tabes Mesenterica	53	35	15	2	1	...	...	...	...	...	...	...	...	...
	Hydrocephalus	97	31	44	11	5	2	2	...	2	...	...	...	...	...
	Phthisis	614	2	5	7	7	35	53	158	164	113	56	13	1	...
	Scrofula, Tuberculosis	92	29	36	9	2	2	4	5	3	1	1	...	...	...
	Constitutional Diseases (other)	40	2	2	1	2	...	...	1	10	6	8	8	...	...
V.	Premature Birth	129	129	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	32	30	2	...	...	..	..	...	...	...	...	...	...	...
	Old Age	85	...	...	...	...	...	...	...	...	...	5	31	40	9
VI.	Apoplexy, Hemiplegia	171	1	2	...	1	4	...	3	11	25	54	58	11	1
	Epilepsy	21	...	...	...	5	1	1	2	3	4	2	3	...	...
	Convulsions	165	136	27	2	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)	242	39	46	7	4	3	5	18	21	28	34	24	13	...
	Heart Diseases	379	7	2	5	8	17	10	34	62	67	79	58	28	2
	Croup	14	...	10	4	..	...	...	...	...	...	...	...	...	...
	Bronchitis	490	153	77	3	...	1	2	7	24	49	63	70	36	5
	Pneumonia	572	143	122	20	8	11	16	37	54	70	57	28	6	...
	Respiratory Diseases (other)	97	21	17	3	1	...	2	10	11	12	10	8	2	...
	Digestive Organs (Diseases of)	224	68	20	5	5	7	4	12	20	30	32	17	4	...
	Urinary Organs (Diseases of)	142	4	2	3	3	3	6	14	21	30	24	25	5	2
	Reproductive Organs (Dis. of)	2	...	...	...	...	...	...	...	...	1	...	1	...	...
	Local Diseases (other)	46	7	10	2	6	2	4	2	1	4	5	3	...	...
VII.	Violence	249	48	39	12	10	9	8	23	30	28	22	18	2	...
VIII.	Marasmus, Atrophy	276	241	24	1	...	...	...	...	...	...	...	5	4	1
	Other Ill-defined Causes	139	48	10	2	1	...	2	6	8	27	18	14	3	...

TABLE D.—MANCHESTER, 1894.

Causes of Deaths at different Life Periods—FEMALES.

Classes	CAUSES OF DEATH	All Ages	Ages at Death—in years												
			Under 5 Years												
		Total	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	5059	1205	796	142	75	101	127	360	483	462	531	517	231	29
I.	Smallpox	6	...	1	1	...	1	...	...	3	...	...	...	...	...
	Measles	100	19	72	8	...	...	1	...	...	...	...	...	...	...
	Scarlet Fever	66	9	42	10	2	2	...	...	1	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	161	59	98	4	...	...	...	...	...	...	...	...	...	...
	Diphtheria	55	3	35	13	3	...	...	1	...	...	...	...	...	...
	Membranous Croup	23	...	20	3	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	2	...	...	...	1	1	...	...	...	...	...	...	...	...
	Enteric Fever	35	...	1	3	8	4	1	12	4	2	...	...	...	...
	Influenza	25	1	1	...	...	1	3	4	3	2	6	2	2	...
	Simple Cholera	4	1	1	1	...	...	...	...	...	...	1	...	...	...
	Diarrhœa, Dysentery	181	112	36	3	...	1	...	2	2	2	7	11	5	...
	Venereal Affections	37	33	4	...	...	...	...	...	...	...	...	...	...	...
	Erysipelas	14	3	1	...	...	1	...	1	1	1	2	2	2	...
	Pyæmia	12	5	...	...	...	...	...	3	2	...	1	1	...	...
	Puerperal Fever	32	...	...	...	...	...	8	14	9	1	...	...	...	...
	Other Zymotics	2	...	1	...	...	...	...	...	1	...	...	...	...	...
II.	Parasitic Diseases	2	2	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	23	1	...	...	...	...	...	4	7	4	5	2	...	...
IV.	Rheumatic Fever	25	...	1	3	3	4	3	5	3	3	...	...	...	...
	Rickets	10	3	7	...	...	...	...	...	...	...	...	...	...	...
	Cancer	220	1	...	...	2	...	1	11	38	64	61	38	4	...
	Tabes Mesenterica	41	29	9	1	2	...	...	...	...	...	...	...	...	...
	Hydrocephalus	75	28	31	6	3	4	1	1	1	...	...	...	...	...
	Phthisis	412	1	6	14	9	40	37	119	111	52	17	6	...	...
	Scrofula, Tuberculosis	87	28	28	6	4	1	4	5	6	1	3	1	...	...
	Constitutional Diseases (other)	49	1	3	...	1	5	3	5	4	2	10	12	3	...
V.	Premature Birth	103	103	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	24	23	...	...	1	...	...	...	...	...	...	...	...	...
	Old Age	133	...	...	...	...	...	...	...	...	2	5	48	61	17
VI.	Apoplexy, Hemiplegia	202	1	...	...	...	...	...	11	14	43	51	61	20	1
	Epilepsy	20	...	1	...	...	...	1	4	9	5	...	...	...	...
	Convulsions	128	94	29	3	1	...	...	...	...	...	...	1	...	...
	Brain and Nervous Dis. (other)	193	30	34	6	5	6	6	7	31	25	20	16	7	...
	Heart Diseases	448	7	...	3	11	7	12	34	72	71	110	93	27	1
	Croup	17	3	12	2	...	...	...	...	...	...	...	...	...	...
	Bronchitis	553	122	61	4	1	1	1	16	33	57	97	110	45	5
	Pneumonia	463	94	155	14	9	4	16	32	36	36	29	21	17	...
	Respiratory Diseases (other)	65	10	14	...	...	1	4	5	5	9	8	6	2	1
	Digestive Organs (Diseases of)	276	85	20	7	2	7	11	20	28	28	30	27	11	...
	Urinary Organs (Diseases of)	112	2	11	3	3	3	3	9	16	16	23	18	4	1
	Reproductive Organs (Dis. of)	63	...	1	...	...	...	7	25	22	6	2	...	...	...
	Local Diseases (other)	46	3	4	2	3	5	2	2	5	3	8	5	4	...
VII.	Violence	144	40	21	21	1	2	1	4	7	15	14	12	5	1
VIII.	Marasmus, Atrophy	257	208	25	1	...	...	...	...	...	...	4	11	6	2
	Other Ill-defined Causes	113	41	10	...	...	...	1	4	9	12	17	13	6	...

TABLE E.

City of Manchester, 1894.—Causes of Death in Infancy and Childhood.

Causes of Death	Under One Year			Total under One Year	One and under Five Years				Total under Five Years
	Under 3 months	3–6 months	6–12 months		1–	2–	3–	4–	
All Causes	**1177**	**595**	**861**	**2633**	**903**	**340**	**242**	**132**	**4250**
Measles	2	6	37	45	97	38	17	10	207
Scarlatina	...	1	11	12	20	14	27	10	83
Whooping Cough	15	26	67	108	93	45	18	13	277
Diphtheria (Memb: Croup)	1	1	10	12	33	23	29	17	114
Fever (various forms)	...	...	1	1	1	...	...	1	3
Diarrhœa	51	70	105	226	69	9	4	1	309
Syphilis	39	13	10	62	6	...	...	...	68
Hydrocephalus	3	10	46	59	30	20	17	8	134
Scrofula (other)	34	44	46	124	52	25	11	11	223
Premature Birth	231	1	...	232	...	...	...	...	232
Convulsions	145	31	54	230	40	7	7	2	286
Brain Diseases (other)	10	18	43	71	47	14	13	9	154
Lung Diseases	132	163	251	546	274	99	66	29	1014
Teething	...	1	18	19	2	...	...	...	21
Atrophy, Marasmus	289	104	56	449	41	7	1	...	498
Found Dead in Bed	52	27	14	93	2	...	...	...	95
Suffocation	6	4	...	10	1	...	1	...	12
Violence (other forms)	5	4	2	11	19	14	14	10	68
Ill-defined Causes	30	12	21	63	13	3	2	1	82
Unclassified	132	59	69	260	63	22	15	10	370

TABLE F, 1871 TO 1894.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS (*a*) from all causes, and (*b*) from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions.

Years	Estimated Populations	Persons Married	Annual Rates per 1,000 Persons living													Percentages to Total Deaths		Years
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
	(Mean)																	
Quinquennial Averages 1871–75	477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03	0·94	7·2	13·4	1871–75 Quinquennial Averages
1876–80	509,802	18·6	38·7	26·2	0·24	0·53	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04	0·89	7·5	14·3	1876–80
1881–85	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03	0·72	7·0	15·9	1881–85
1886–90	575,630	16·6	33·4	24·6	0·02	0·83	0·50	0·32	0·54	0·02	0·30	0·01	1·06	0·02	0·78	6·9	17·7	1886–90
Avge. 20 yrs. 1871–90	526,380	19·4	36·5	25·7	0·14	0·68	0·78	0·16	0·71	0·07	0·30	0·09	1·29	0·03	0·83	7·1	15·3	1871–90 Avge. 20 yrs.
1871	464,866	24·2	38·1	29·3	0·72	0·84	0·71	0·04	0·61	0·20	0·45	0·35	2·58	0·02	0·90	6·3	13·7	1871
1872	471,023	25·8	39·3	27·3	0·32	0·33	1·02	0·09	1·22	0·17	0·40	0·17	2·07	0·04	0·90	6·9	13·5	1872
1873*	477,261	24·8	38·3	28·0	0·08	0·85	1·43	0·05	0·38	0·15	0·46	0·20	1·92	0·05	0·83	7·3	12·8	1873*
1874	483,582	23·8	39·3	28·7	0·05	0·62	1·33	0·07	0·83	0·08	0·39	0·19	1·71	0·01	0·94	7·3	13·5	1874
1875	489,987	24·2	39·5	28·4	0·11	0·54	0·92	0·14	0·88	0·11	0·44	0·12	1·32	0·01	1·12	8·4	13·3	1875
1876	496,476	20·2	40·0	28·0	0·80	0·65	1·13	0·10	0·81	0·16	0·42	0·17	1·50	0·02	1·05	7·4	14·4	1876
1877	503,051	19·8	39·5	26·1	0·36	0·59	1·05	0·13	0·84	0·11	0·29	0·12	0·82	0·01	0·86	7·9	14·9	1877
1878	509,714	18·8	39·7	26·8	0·01	0·45	1·07	0·14	0·68	0·06	0·31	0·10	1·42	0·07	0·91	7·6	14·4	1878
1879*	516,464	16·8	37·3	25·2	0·00	0·35	1·07	0·13	1·09	0·02	0·18	0·07	0·62	0·01	0·81	7·3	14·2	1879*
1880	523,304	17·2	36·9	25·0	0·01	0·63	1·03	0·14	0·76	0·04	0·26	0·07	1·73	0·09	0·80	7·1	13·7	1880
1881	530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02	0·84	8·1	15·9	1881
1882	536,324	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·00	0·03	0·67	7·2	14·5	1882
1883	542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03	0·73	7·0	15·5	1883
1884*	549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05	0·65	6·2	17·3	1884*
1885	555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02	0·69	6·4	16·4	1885
1886	562,166	16·4	34·7	24·1	0·00	0·27	0·41	0·15	0·57	0·03	0·29	0·01	1·34	0·04	0·71	7·2	17·0	1886
1887	568,819	16·6	33·9	25·4	0·01	1·54	0·63	0·23	0·50	0·02	0·31	0·01	1·19	0·02	0·77	6·9	16·1	1887
1888	575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01	0·74	6·7	18·3	1888
1889	582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03	0·89	6·5	18·2	1889
1890*	589,253	17·0	31·8	26·2	...	0·83	0·60	0·36	0·37	0·01	0·27	0·02	1·04	0·02	0·79	7·0	19·1	1890*
1891†	‡508,673	17·2	33·8	26·0	...	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04	0·79	6·8	18·4	1891†
1892†	‡513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02	0·77	7·4	18·2	1892†
1893†	‡517,760	16·0	33·4	24·3	0·09	0·57	0·27	0·35	0·46	0·00	0·25	0·01	1·75	0·10	0·76	6·9	18·7	1893†
1894†	‡522,365	16·8	31·8	19·8	0·04	0·42	0·22	0·29	0·55	...	0·17	0·01	0·70	0·02	0·75	7·5	21·3	1894†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.

TABLE G, 1881 TO 1894.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

	Year	Annual Rates per 1,000 Persons living										Rates per 1,000 Births	
		Cancer	Tabes Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennial Periods	1881–85	0·50	0·35	2·42	0·57	3·28	1·37	5·41	1·23	0·48	0·08	3·03	1·99
	1886–90	0·64	0·36	2·24	0·59	3·09	1·73	5·76	1·23	0·61	0·08	3·22	2·13
Average 10 years	1881–90	0·57	0·36	2·33	0·58	3·19	1·55	5·58	1·23	0·54	0·08	3·13	2·08
	1881	0·48	0·28	2·46	0·52	3·33	1·19	5·57	1·24	0·39	0·07	3·15	1·37
	1882	0·44	0·40	2·41	0·61	3·35	1·34	5·33	1·19	0·45	0·08	3·92	1·62
	1883	0·54	0·34	2·54	0·59	3·32	1·33	5·66	1·20	0·50	0·06	2·27	1·58
	1884*	0·51	0·39	2·34	0·56	3·27	1·44	4·88	1·23	0·59	0·10	2·81	2·55
	1885	0·51	0·36	2·34	0·56	3·12	1·53	5·59	1·28	0·49	0·08	3·05	2·84
	1886	0·56	0·43	2·44	0·59	3·30	1·53	5·43	1·26	0·57	0·08	2·67	1·85
	1887	0·62	0·39	2·19	0·53	3·17	1·66	5·72	1·23	0·53	0·08	3·58	1·35
	1888	0·65	0·31	2·14	0·62	3·19	1·72	5·31	1·16	0·62	0·10	4·12	1·77
	1889	0·70	0·36	2·12	0·59	2·94	1·79	5·06	1·28	0·64	0·08	3·06	1·87
	1890*	0·65	0·33	2·33	0·62	2·87	1·93	7·28	1·22	0·66	0·08	2·68	3·89
	1891†	0·63	0·25	2·20	0·78	3·10	1·89	6·77	1·03	0·55	0·07	3·08	4·01
	1892†	0·61	0·21	2·05	0·75	2·44	1·84	5·44	1·14	0·53	0·05	3·79	4·54
	1893†	0·59	0·26	2·05	0·76	2·51	1·66	5·53	1·20	0·53	0·07	3·70	3·94
	1894†	0·66	0·18	1·97	0·67	2·19	1·58	4·35	0·96	0·49	0·04	1·93	2·77

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE H, 1894.—POPULATION, AREA, DENSITY. TOTAL BIRTHS AND DEATHS, WITH BIRTH AND DEATH RATES.

[INSTITUTION POPULATIONS, BIRTHS AND DEATHS, DISTRIBUTED.]

STATISTICAL DIVISIONS	Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS	
				Total	Rate per 1,000	Total	Rate per 1,000
City of Manchester	**522,365**	**12,788**	**41**	**16,608**	**31·79**	**10,355**	**19·82**
I. Manchester Township..	147,138	1,646	89	4,920	33·44	3,718	25·27
II. North Manchester	133,404	7,191	19	4,177	31·31	2,070	15·52
III. South Manchester	241,823	3,951	61	7,511	31·06	4,567	18·89
(TOWNSHIPS)							
I. Ancoats	46,486	400	116	1,636	35·19	1,251	26·91
Central	37,326	748	50	1,106	29·63	998	26·74
St. George's..............	63,326	498	127	2,178	34·39	1,469	23·20
II. Cheetham	29,926	919	33	935	31·24	384	12·83
Crumpsall	8,537	733	12	199	23·31	93	10·89
Blackley	7,610	1,840	4	203	26·68	125	16·43
Harpurhey	10,109	193	52	295	29·18	133	13·16
Moston	5,867	1,297	5	159	27·10	66	11·25
Newton Heath	35,632	1,350	26	1,087	30·51	628	17·62
Bradford	21,677	288	75	815	37·60	422	19·47
Beswick	10,307	96	107	361	35·02	156	15·14
Clayton	3,739	475	8	123	32·90	63	16·85
III. Ardwick	36,409	509	72	1,220	33·51	650	17·85
Openshaw	27,632	581	48	915	33·11	448	16·21
West Gorton	26,339	342	77	927	35·19	503	19·10
Rusholme and Kirk. ...	18,493	1,396	13	406	21·95	267	14·44
Chorlton-upon-Medlock	60,697	646	94	1,688	27·81	1,103	18·17
Hulme.....................	72,253	477	151	2,355	32·59	1,596	22·09

TABLE J, 1894.

Births Registered in the City of Manchester, in its Main Divisions, and in Townships; Distinguishing Legitimate and Illegitimate Births: also the Proportion of Mortality among Infants of both Classes under One Year of Age.

	STATISTICAL AREAS	BIRTHS		Percentage of Illegitimate Births to Total Births	Deaths under 1 Year		Proportion of Deaths under 1 Year Per 1,000 Births		
		Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
	City of Manchester……	**16,608**	**734**	**4·42**	**2,633**	**248**	**159**	**150**	**338**
	(DIVISIONS)								
I.	Manchester Township	4,920	251	5·10	921	103	187	175	410
II.	North Manchester……	4,177	105	2·51	536	27	128	125	257
III.	South Manchester …..	7,511	378	5·03	1,176	118	157	148	312
	(TOWNSHIPS)								
I.	Ancoats ……………	1,636	59	3·61	327	22	200	193	373
	Central ……………	1,106	99	8·95	233	44	211	188	445
	St. George's ………	2,178	93	4·27	361	37	166	155	398
II.	Cheetham …………	935	26	2·78	86	5	92	89	192
	Crumpsall ….. ……	199	9	4·53	18	1	90	89	111
	Blackley……………	203	1	0·49	22	1	108	104	1000
	Harpurhey…………	295	8	2·71	28	2	95	91	250
	Moston ……………	159	3	1·89	15	1	94	90	333
	Newton Heath ……	1,087	23	2·12	166	6	153	150	261
	Bradford …………	815	22	2·70	130	8	160	154	364
	Beswick……………	361	8	2·22	51	2	141	139	250
	Clayton ……………	123	5	4·07	20	1	163	161	200
III.	Ardwick ……………	1,220	44	3·61	200	18	164	155	409
	Openshaw …………	915	35	3·83	141	11	154	148	314
	Gorton (West) ……	927	44	4·75	148	12	160	154	273
	Rusholme and Kirk.	406	14	3·45	59	1	145	148	71
	Chorlton-on-Medlock	1,688	138	8·17	226	34	134	124	246
	Hulme ……………	2,355	103	4·37	402	42	171	160	408

TABLE K, 1894.

INFANTILE MORTALITY IN MANCHESTER CITY, AND ITS THREE MAIN DIVISIONS.*

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	158·54	187·20	128·32	156·57
Measles	2·71	0·81	1·68	4·53
Whooping Cough	6·50	5·89	5·75	7·32
Other Com: Infectious Diseases†	1·57	1·42	0·96	2·00
Diarrhœa	13·61	19·92	10·29	11·32
Tubercular Diseases‡	11·02	9·76	6·70	14·25
Convulsions	13·85	16·67	13·17	12·38
Other Nervous Diseases§	4·28	6·91	3·35	3·06
Lung Diseases	32·88	40·65	27·05	31·02
Wasting Diseases‖................	41·00	48·37	36·15	38·88
Suffocation	0·60	0·41	0·24	0·93
Found dead in bed	5·60	9·35	2·87	4·66

* For Infantile Mortality in Townships, see pages 151 to 153.

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fever," including the chief form of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

‖ These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE L, 1894.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL AREAS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	19·82	25·27	15·52	18·89
Smallpox	0·04	0·05	0·05	0·02
Measles	0·42	0·26	0·30	0·60
Scarlet Fever	0·22	0·26	0·18	0·22
Typhus Fever	...	...	...	...
Whooping Cough	0·55	0·55	0·45	0·60
Diphtheria, Membranous Croup	0·29	0·27	0·37	0·24
Ill-defined Fever	0·01	0·01	...	0·01
Enteric Fever	0·17	0·23	0·14	0·16
Influenza	0·09	0·10	0·06	0·10
Diarrhœa, Dysentery	0·70	1·11	0·52	0·54
Erysipelas	0·04	0·07	0·02	0·05
Pyæmia	0·03	0·05	0·03	0·03
Puerperal Fever	0·06	0·03	0·10	0·06
Rheumatic Fever	0·08	0·06	0·09	0·09
Rickets	0·06	0·06	0·04	0·08
Cancer	0·66	0·65	0·58	0·71
Tabes Mesenterica	0·18	0·16	0·14	0·22
Hydrocephalus	0·33	0·43	0·17	0·36
Phthisis	1·97	2·97	1·27	1·73
Scrofula, Tuberculosis	0·34	0·39	0·24	0·37
Premature Birth	0·44	0·46	0·34	0·49
Old Age	0·42	0·57	0·34	0·36
Brain and Nervous Diseases	2·19	2·68	1·90	2·04
Heart Diseases	1·58	2·00	1·21	1·53
Bronchitis	2·00	2·88	1·27	1·86
Pneumonia	1·98	2·79	1·53	1·74
Respiratory Diseases (other)	0·37	0·41	0·32	0·37
Digestive Organs (Diseases of)	0·96	1·06	0·75	1·01
Urinary Organs (Diseases of)	0·49	0·61	0·44	0·43

TABLE M, 1894.—CITY OF MANCHESTER.—ANNUAL RATES OF MORTALITY AT SIX GROUPS OF AGES, * PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH		Under 5 Years	5 to 15 Years	15 to 25 Years	25 to 45 Years	45 to 65 Years	Over 65 Years
All Causes		64·89	3·84	4·52	11·26	29·78	104·22
Smallpox		0·05	0·03	0·02	0·07	0·03	...
Measles		3·16	0·12	0·01	...	...	...
Scarlatina		1·27	0·24	0·04	0·01	...	...
Diphtheria, Memb. Croup		1·74	0·28	...	0·01	...	...
Whooping Cough		4·23	0·08	...	...	...	...
Fever	Typhus	...	...	...	...	...	...
	Enteric	0·03	0·17	0·24	0·21	0·17	...
	Continued	0·02	0·01	0·01	0·01	...	...
Diarrhœal Diseases		4·79	0·05	0·01	0·05	0·29	1·95
Tubercular Diseases		5·45	0·76	1·75	3·80	3·48	1·57
Diseases of ...	Brain	6·72	0·29	0·26	0·89	4·16	16·17
	Heart	0·24	0·23	0·44	1·34	4·67	15·65
	Lungs	15·48	0·59	0·56	1·78	7·10	27·10
	Digestive System	2·95	0·16	0·27	0·53	1·71	4·42
	Urinary System	0·29	0·10	0·14	0·40	1·33	4·12
Other Diseases		18·47	0·71	0·78	2·16	6·84	33·24

* For death-rates at all ages, see Table L.

TABLE N, 1894.—ANNUAL RATES OF MORTALITY IN STATISTICAL DIVISIONS, AT SIX GROUPS OF AGES, *PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH		Under 5 Years			5 to 15 Years			15 to 25 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		78·24	50·48	65·08	5·34	3·53	3·12	5·25	4·26	4·22
Smallpox		...	0·11	0·03	0·06	0·06	...	0·03	0·04	...
Measles		1·79	2·18	4·59	0·12	0·06	0·15	0·03	...	...
Scarlatina		1·14	0·97	1·52	0·50	0·22	0·09	0·03	...	0·06
Diphtheria, Memb. Croup		1·96	2·12	1·38	0·12	0·39	0·32	...	...	...
Whooping Cough		4·19	3·44	4·72	0·12	...	0·09	...	...	...
Fever	Typhus	...	...	...	...	...	...	...	...	...
	Enteric	0·05	...	0·03	0·37	0·13	0·08	0·27	0 18	0·24
	Continued	...	...	0·03	0·03	...	...	0·03	...	...
Diarrhœal Diseases		7·61	3·15	4·01	0·03	0·10	0·04	...	..	0·02
Tubercular Diseases		6·09	3·21	6·37	1·37	0·42	0·60	1·94	1·76	1·63
Diseases of	Brain	9·03	5·96	5·73	0·37	0·29	0·24	0·31	0·37	0·16
	Heart	0·05	0·17	0·40	0·37	0·13	0·21	0·55	0·40	0·39
	Lungs	19·57	11·75	15·14	0·81	0·61	0·45	0·82	0·40	0·49
	Digestive System	3·43	2·18	3·10	0·19	0·19	0·13	0·24	0·26	0·31
	Urinary System	0·27	0·40	0·24	0·06	0·19	0·08	0·21	0·11	0·12
Other Diseases		23·05	14·84	17·77	0·81	0·74	0·64	0·78	0·73	0·80

CAUSES OF DEATH		25 to 45 Years			45 to 65 Years			Over 65 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		15·28	8·19	10·44	40·04	21·76	27·34	132·04	87·78	97·56
Smallpox		0·09	0·05	0·06	0·05	...	0·03	...	...	...
Measles		...	...	...	...	...	...	...	...	...
Scarlatina		...	...	0·01	...	...	...	...	...	...
Diphtheria, Memb. Croup		...	0·03	0·01	...	...	...	...	...	...
Whooping Cough		...	...	...	...	...	...	...	...	...
Fever	Typhus	...	...	...	...	...	...	...	...	...
	Enteric	0·19	0·16	0·25	0·24	0·24	0·09	...	...	...
	Continued	...	...	0·03	...	...	...	...	...	...
Diarrhœal Diseases		0·07	0·05	0·04	0·48	0·30	0·15	3·13	1·82	1·38
Tubercular Diseases		5·72	2·40	3·38	5·47	2·02	2·97	2·85	0·30	1·53
Diseases of	Brain	1·07	0·88	0·77	5·23	3·27	3·92	15·08	12·71	18·50
	Heart	1·84	0·85	1·28	6·05	3·69	4·29	17·36	14·83	15·14
	Lungs	2·71	1·28	1·49	10·90	4·52	5·99	40·41	17·25	24·93
	Digestive System	0·61	0·35	0·58	1·82	1·13	1·95	4·55	5·16	3·98
	Urinary System	0·54	0·29	0·37	1·54	1·19	1·27	6·26	3·63	3·21
Other Diseases		2·45	1·84	2·16	8·26	5·41	6·67	42·40	32·08	28·90

* For death-rates at all ages, see Table L.

TABLE O, 1894.

MANCHESTER.—Certification of the Causes of Death in the Main Divisions and in Townships.

STATISTICAL AREAS	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
					Certified by		Not Certified
		Registered Medical Practitioners	Coroner		Regist'd Medical Practitioners	Coroner	
City of Manchester	10,355	9,434	781	140	91·2	7·5	1·3
(DIVISIONS)							
I. Manchester Township	3,718	3,358	295	65	90·3	7·9	1·8
II. North Manchester	2,070	1,895	159	16	91·5	7·7	0·8
III. South Manchester	4,567	4,181	327	59	91·5	7·2	1·3
(TOWNSHIPS)							
I. Ancoats	1,251	1,129	91	31	90·2	7·3	2·5
Central	998	877	102	19	87·9	10·2	1·9
St. George's	1,469	1,352	102	15	92·1	6·9	1·0
II. Cheetham	384	351	32	1	91·4	8·3	0·3
Crumpsall	93	86	7	...	92·5	7·5	...
Blackley	125	116	8	1	92·8	6·4	0·8
Harpurhey	133	121	11	1	90·9	8·3	0·8
Moston	66	62	3	1	94·0	4·5	1·5
Newton Heath	628	568	55	5	90·4	8·8	0·8
Bradford	422	386	29	7	91·4	6·9	1·7
Beswick	156	146	10	...	93·6	6·4	...
Clayton	63	59	4	...	93·7	6·3	...
III. Ardwick	650	586	50	14	90·1	7·7	2·2
Openshaw	448	415	30	3	92·6	6·7	0·7
Gorton (West)	503	453	41	9	90·1	8·1	1·8
Rusholme and Kirk.	267	243	20	4	91·0	7·5	1·5
Chorlton-upon-Medlock	1,103	1,021	73	9	92·6	6·6	0·8
Hulme	1,596	1,463	113	20	91·6	7·1	1·3

TABLE P, 1894.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

DISEASE	HOSPITAL	In Hospital commencement of year	Admitted	Discharged	Died	Remaining in Hospital close of year
SMALLPOX	Monsall and Clayton Hospitals	4	279	263	20	...
	Total	4	279	263	20	...
SCARLET FEVER ...	Monsall	213	1,366	1,231	63	285
	Pendlebury	11	100	79	7	25
	Other Hospitals.........	...	1	1	...	...
	Total	224	1,467	1,311	70	310
DIPHTHERIA	Monsall	10	111	87	24	10
	Pendlebury	...	2	2	...	...
	Other Hospitals	...	4	...	4	...
	Total	10	117	89	28	10
ENTERIC FEVER ...	Monsall	30	218	188	35	25
	Pendlebury	2	9	9	2	...
	Other Hospitals	5	16	16	4	1
	Total	37	243	213	41	26
TYPHUS FEVER	Monsall	...	...	...	...	...
	Pendlebury	...	...	...	...	...
	Other Hospitals	...	...	...	...	...
	Total	...	...	...	...	...
OTHER ACUTE DISEASES	Monsall	8	207	181	25	9
	Pendlebury	...	6	6	...	...
	Other Hospitals	...	...	...	...	...
	Total	8	213	187	25	9
ALL DISEASES..........................		283	2,319	2,063	184	355

PATIENTS SENT TO MONSALL AND CLAYTON, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1894.

DISEASE	Salford	Withington	Stretford	Moss Side	Swinton	Sale	Gorton	Failsworth	Other Districts
Smallpox	...	1	...	2	...	...	5	4	1
Scarlatina	...	42	27	27	11	5	11	12	9
Diphtheria	...	2	2	1	...	1	...	1	1
Enteric Fever	...	5	...	5	1	1	3	...	3
Other Diseases...............	...	2	5	4	6	...	3	...	6

TABLE Q.—Recorded and Corrected Death-rates per 1,000 Persons living in 33 Great Towns during the Year 1894.

Towns in the order of their Corrected Average Death-rates	Standard Death-rate	Factor for correction for Sex and Age distribution	Recorded Average Death-rate, 1894	Corrected Death-rate, 1894	Comparative Mortality Figure, 1894
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19·15	1·0000	16·59	16·59	1,000
England and Wales less the 33 Towns	19·45	0·9846	15·78	15·54	937
33 Towns	17·71	1·0813	18·12	19·59	1,181
Croydon	18·37	1·0424	13·19	13·75	829
Portsmouth	18·73	1·0224	15·15	15·49	934
Leicester	17·64	1·0855	14·65	15·90	958
Derby	17·36	1·1031	15·01	16·56	998
Brighton	18·94	1·0110	16·41	16·59	1,000
West Ham	17·75	1·0788	16·17	17·44	1,051
Plymouth	19·70	0·9720	18·30	17·79	1,072
Norwich	19·99	0·9579	18·74	17·95	1,082
Bristol	18·33	1·0447	17·26	18·03	1,087
Cardiff	17·16	1·1159	16·22	18·10	1,091
Hull	18·23	1·0504	17·36	18·23	1,099
Halifax	17·20	1·1133	16·48	18·35	1,106
Huddersfield	16·47	1·1627	15·80	18·37	1,107
Nottingham	17·81	1·0752	17·24	18·54	1,118
Swansea	17·53	1·0924	17·04	18·61	1,122
London	17·97	1·0656	17·76	18·93	1,141
Gateshead	17·83	1·0740	17·66	18·97	1,143
Bradford	16·73	1·1446	17·00	19·46	1,173
Sheffield	17·22	1·1120	17·77	19·76	1,191
Leeds	17·28	1·1082	17·87	19·80	1,193
Birkenhead	17·42	1·0993	18·06	19·85	1,197
Newcastle	17·58	1·0892	18·29	19·92	1,201
Blackburn	17·05	1·1231	17·89	20·09	1,211
Birmingham	17·33	1·1050	18·59	20·54	1,238
Bolton	16·90	1·1331	18·79	21·29	1,283
Oldham	16·72	1·1453	18·61	21·31	1,285
Burnley	16·67	1·1487	18·70	21·48	1,295
Wolverhampton	18·30	1·0464	20·70	21·66	1,306
Sunderland	18·25	1·0493	20·78	21·80	1,314
Manchester	16·90	1·1331	19·82	22·46	1,354
Preston	17·42	1·0993	20·81	22·88	1,379
Salford	17·03	1·1244	21·00	23·61	1,423
Liverpool	17·26	1·1094	23·85	26·46	1,595

TABLE R, 1894.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

		TOWNSHIPS																		
		Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
Complaints to Sanitary Superintendent ...		1,858	1,266	1,190	1,043	86	47	85	32	395	641	179	54	922	282	384	57	1,073	1,148	10,742
Inspections of	Dwelling-houses	4,666	2,480	6,403	2,876	1,537	326	310	633	2,109	335	118	4,604	2,028	2,133	859	2,830	2,795	4,169	41,211
	Newly-infected Dwelling-houses	278	172	400	195	45	33	106	29	349	121	58	19	145	142	175	89	321	391	3,068
	Cellars	441	3	36	...	4	...	...	...	...	32	12	...	...	...	...	...	...	9	537
	Schools	32	4	9	2	4	6	2	...	34	...	...	...	5	2	1	2	5	4	112
	Factories and Workshops	109	102	29	39	3	...	...	4	1	...	...	1	12	...	...	...	16	19	335
	Lodging-houses	619	251	526	296	...	2	...	...	130	29	9	...	51	21	12	9	74	276	2,305
	Offensive Trades	99	6	42	10	4	2	7	...	102	42	25	29	52	30	4	6	2	2	464
	Dairies and Milkshops	667	358	710	328	44	19	38	88	503	312	188	124	321	179	193	429	603	473	5,574
	Bakehouses	198	290	199	149	4	32	7	...	46	22	37	3	141	36	47	40	271	516	2,038
	Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,050
	Slaughter-houses	...	...	...	...	2	...	...	...	9	...	...	...	2	...	6	116	...	4	139
	Tips for Refuse	...	...	11	...	1	10	130	83	47	7	2	4	1	45	...	5	...	...	346
	Miscellaneous Inspections	2,201	1,750	1,872	468	108	22	34	295	1,561	87	61	239	47	914	165	636	353	699	11,512
	Factories and Workshops by Shop Hours, &c., Inspectors	548	3,317	625	1,243	16	67	11	4	109	33	65	17	261	80	55	41	1,163	945	8,600
	Shops by Shop Hours, &c., Inspectors	716	782	848	352	28	136	24	35	321	...	302	...	53	359	330	124	462	1,511	6,383
Re-inspections of Infected Dwelling-houses		1,430	598	1,306	623	154	76	299	69	1,172	635	361	184	495	541	244	368	722	1,127	10,404
Rooms Fumigated after Infectious Disease		598	293	1,101	275	133	14	69	44	1,050	201	108	42	361	374	162	259	306	567	5,957
Drains Tested by Smoke Machine		11	16	7	2	44	...	...	2	15	13	...	...	2	...	...	6	4	107	229
Smoke Abatement	Observations made	242	643	113	77	51	16	19	18	140	30	15	19	128	74	73	29	106	91	1,884
	Proceedings before Magistrates	5	48	14	14	6	1	1	3	12	3	...	1	9	9	8	...	14	3	151
Food Adulteration	Samples Collected for Analysis	213	176	132	48	8	3	37	13	95	42	43	11	152	92	107	26	202	205	*1,620
	Proceedings before Magistrates	9	25	7	12	...	...	3	...	4	8	4	...	6	1	5	...	5	8	97
Ashpits reported to Cleansing Department for emptying		368	16	32	25	952	167	638	266	1,753	1,799	...	243	1	269	259	219	97	17	7,121
Receptacles reported to Cleansing Department for emptying		1,025	103	743	1,548	...	1	110	...	304	301	1,204	1	27	1	...	7	292	48	5,715
Notices issued for Abatement of Nuisances.		1,653	1,343	2,105	1,410	203	175	261	102	866	460	195	218	687	779	418	483	1,972	1,961	15,291
Letters written for Abatement of Nuisances		76	80	103	80	4	6	20	3	47	2	8	6	25	36	32	19	72	34	653
Reports made to Medical Officer of Health		698	266	613	181	43	40	38	34	246	144	65	1	378	141	227	155	491	616	4,377
Legal proceedings taken		82	32	38	24	1	...	1	...	4	...	3	3	2	...	...	1	27	21	239
Total Nuisances abated		1,356	776	1,904	1,645	185	177	259	80	852	460	186	183	515	746	393	463	1,451	1,446	13,077
Number of Cottages under Five Rooms...		7,435	4,964	9,037	729	522	923	688	367	4,409	2,621	1,285	402	4,552	3,510	3,221	826	3,805	8,167	57,463

* Fifteen samples procured outside the City.

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